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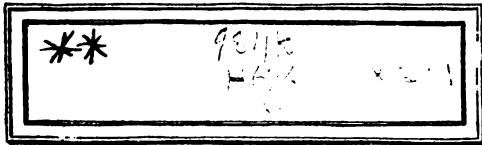
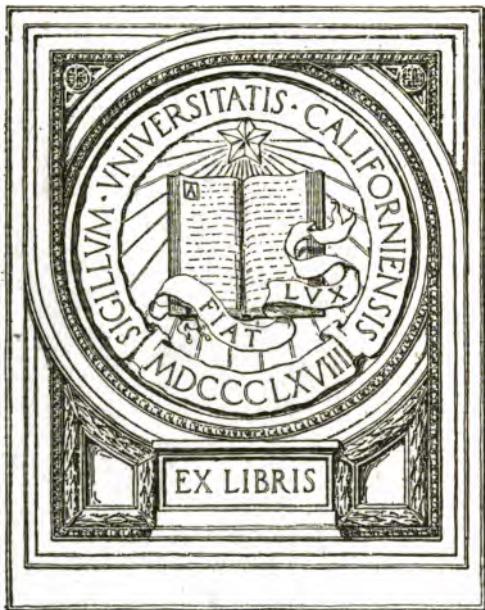
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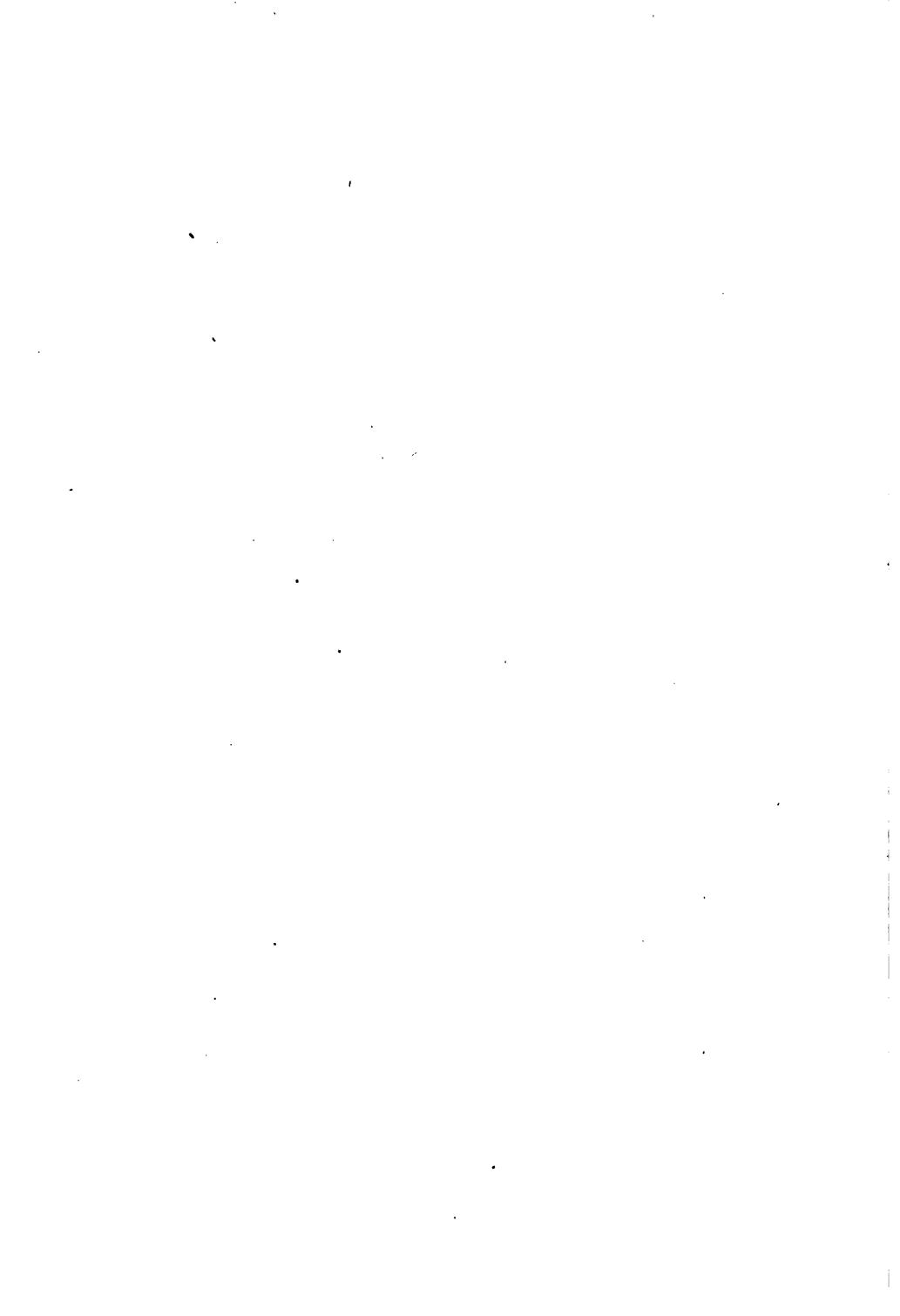
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BRIEF

August 11. 1902.

HISTORY OF CULTURE.

BY

JOHN S. HITTELL.

SECOND EDITION, REWRITTEN.

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PREFACE.

Some old words, used in new meanings, and some new words, in this book, need explanation in the preface.

I divide life, with all its thoughts and occupations, into four main parts or branches,—Industry, Polity, Sociality, and Religion; and time into eight periods or steps,—the First or Australian; the Second or Iroquois; the Third or Polynesian; the Fourth or Bronze; the Fifth or Greek-Roman; the Sixth or Medieval; the Seventh or Press; and the Eighth or Steam Era. The first division may be called vital or occupational, the second chronological.

Industry, as here used in its most comprehensive sense, includes all the useful arts, and, among others, commerce, navigation, transportation, geographical discovery, and the application of science to practical purposes. It supplies not only food, clothing, and shelter, but also the weapons, with which political organizations are defended, and the materials with which thought is recorded. Furnishing the means of existence in a world where the multitude are engaged in a constant struggle for life, it occupies the greater part

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of the time and attention of the majority of mankind. Having been the most progressive of all the main departments of thought and giving to the others more stimulation than it has received from them, it has ever been the main force or leading factor of culture.

Polity, considered comprehensively, includes the military and naval, as well as the legislative, administrative, and judicial portions of government. In its higher developments, it establishes constitutional liberty, which educates its citizens, strives to give them equal rights, surrounds them with efficient protection, and grants to many of them a voice in the management of the state. As a factor in culture, Polity comes next to Industry.

For the lack of some better term, the word Sociality is here used to mean the third vital category or division, which includes the domestic relations, manners, ethics, education, literature, science, and ornamental art. Morality began, or made one of its first steps, in the affection of the mother for her child, then bound the family together, and afterward spread out, imposing mutual obligations on larger and larger groups. Education also had its source in the domestic circle.

The term Religion, as here given to the fourth branch of life, means the belief in a divine existence, with or without priesthood attached. It has existed in all ages and countries and in many

PREFACE. ▼

has played prominent parts, though its general influence has been less than that of either Industry, Polity, or Sociality.

Industry being the most important sphere of human activity, is here made the chief basis of the chronological divisions.

Of these, the First, in the order of time and the lowest in culture, is that in which men depended for their food on the wild products of nature before they had learned to till the soil or to keep herds of herbivorous quadrupeds. It may be called the Wild-food, or the Australian Era, the latter name being suggested by the fact that, in modern times, it has been more extensive and, besides, has been more carefully studied by scholars in Australia than elsewhere.

The Second chronological part is that in which men cultivated the soil, but did it in a small way, leaving nearly all the work of tillage to the women, obtaining only scanty crops, and depending for a large portion of their food on the chase. This step reached its highest development, under the observation of civilized men, in the region east of the Mississippi river, and for that reason may be called the Iroquois Step, after the Iroquois Indians. It may also be styled the Scanty-tillage Era.

A higher grade of culture appeared when slaves became numerous and were employed in cultivating the soil, thus largely increasing the

food supply and giving density to population. This, the condition of the tropical Polynesian Islands in the middle of the XVIIIth century, may be called the Polynesian or Extensive-tillage Step.

In the three lowest steps, the best edge tools were of stone, and man made a very important advance when he learned to melt the ores of copper and tin, and to combine the two metals in an alloy which, in certain forms, is hard, elastic, and valuable for knives, axes, swords, and other cutting tools and weapons. Its appearance made the Bronze Age which is best known to us as it existed in Egypt in 1500 B. C. It has also been studied in Mexico and Peru; but the Aztecs and Quichuans had relatively small supplies of bronze and were inferior in their culture to the ancient Egyptians.

The production of steel founded the Fifth or Greek-Roman Era which, as here defined, began in 1000 B. C. and ended in 300 A. D.

The Sixth or Medieval Era lasted eleven centuries until 1450 A. D.

The Seventh or Press Era occupied three centuries; and the title Press indicated not that the world did more printing then than now, but that Gutenberg's invention was the typical feature of the period.

The Eighth or Steam Era comprises the century and a half from 1750 to 1900.

Among the ideas of this book, for which I claim originality, are these:

1. That the subject should be divided into a score or more of parts, defined and named in such a manner that they and the whole subject can be distinctly conceived and their main facts easily remembered.
2. That the division should be made into four vital and eight chronological categories.
3. That the methods in which Industry, Polity, Sociality, and Religion have influenced progress in the different eras should be explained.
4. That tillage preceded pasturage.
5. That the difference between polished and unpolished stone has no historical, though it may have some archaeological, value.
6. That monotheism implies belief in a god who looks with equal favor on all nations and therefore the ancient Jews were not monotheists.
7. That the conception of divine existence began with an animistic God and advanced to a fetishistic God, then to an ancestral God, then to a universal spiritual God who created matter and finally to a pantheistic God, immanent in the material universe.
8. That nearly all the information about the First Step of Culture is to be found in Australia; about the Second in the region east of the Mississippi river; about the Third in tropical Polynesia; about the Fourth in ancient Egypt; about the

Fifth in ancient Greece and Italy; about the Sixth in the basin of the Mediterranean; and about the Seventh and Eighth in Europe and North America.

The brevity of this work forbids citations, but the Appendix mentions some books which the reader may consult for further information.

Culture is here used in its comprehensive meaning of the mental growth of mankind as traceable in history.

JOHN S. HITTELL.

Pioneer Hall, San Francisco, July 7th, 1900.

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APPENDIX.



A BRIEF HISTORY OF CULTURE.

CHAPTER I.

THE AUSTRALIAN STEP.

Section 1. *Races.*—The bareness of man's skin, the blackness of it in his lowest race, and the aboriginal limitation of that race to the tropical regions of the old world where the highest apes are found, are evidences, not counterbalanced by others, that in the torrid zone humanity made its first appearance. The black race includes the Australians and Melanesians; the yellow race, including Chinese, Mongols, Siamese, Burmese, Malays, Polynesians and aboriginal Americans, was presumably evolved from black ancestors in a sub-tropical clime; and the white race, including Aryans and Semites, from yellow ancestry in the temperate zone. The Finns, Magyars, Basques and European Turks may have belonged originally to the yellow race, but if so they have been mixed to so great an extent with white blood that they are now almost white.

Man has existed on the earth for 50,000, and perhaps for 500,000, years. At first his form and his habits were nearer to those of the tropical apes

than at present. After he had acquired the art of speech, and learned to make cutting tools, fire and clothing, he occupied large areas in the temperate zone, and there reached the condition of the aboriginal Australians, the representatives of the lowest grade of culture well known to scholars.

Sec. 2. *Speech*.—Speech was a necessary result of man's combination of throat muscles commanding a wide range of tones, with social habits, superior powers of thought, long life in the individual, and capacity for continuous mental development in the race. The earliest words of the savage were presumably, as those of the infant still are, monosyllabic nouns, such as *moo* for the cow and *quack* for the duck. Later the name of the thing was used figuratively to mean its most notable quality; *snail* meant slowness and *deer* speed. The advance was slow, but it never stopped. For a long time all the words were monosyllables and nouns, though by its position in a sentence any one might convey the idea of a verb or adjective. There were no inflections. The monosyllables being few in number, one word might have many meanings which in speech were distinguished by the pitch of the voice or by an additional word, a class word, as in the Chinese, or by a gesture, as in the Marquesan speech. This monosyllabic vocabulary has now disappeared everywhere except in China and Siam. The savages of Australia, America, Polynesia and Africa use agglutinative tongues,

in which compound words are formed by adding suffixes to indicate modifications of cases in nouns, and tense, person and mood in verbs, the base and the additions all being preserved without change. The monosyllabic is the most primitive, the agglutinative a more developed, and the inflected or Aryan the highest form of speech.

Though much superior to the Chinese in grammatical forms, some savages are decidedly inferior in words expressing ideas of number. The Tasmanians, the Bushmen and some Australians had no name for any numerals except one and two, any higher number was many. The Damaras, an African tribe which has herds of sheep and cows, and should have been in the habit of counting, could not be made to understand quickly that two and two made four.

Articulate language was a great step in human progress. Thought and feeling must have been powerfully stimulated by the habit of freely communicating ideas, which became clearer when distinctly expressed. Virchow is undoubtedly correct in saying "that only after the perceptions have become fixed by language are the senses brought to a conscious possession and real understanding of them."

Sec. 3. *Australia*.—The largest region occupied in historical times by men who had not learned to cultivate the soil is Australia; and as we know more about its aborigines than about any other

non-tilling people, it is for us the typical country of the lowest step in culture known to history. It is the most arid of the continents, the poorest in soil, fauna and flora, and the most isolated, being the only one that has no land connection with another continent. It has no indigenous cereal; no nut equal for food to the chestnut, acorn, walnut, or cocoanut; no fruit that rivals the banana, plantain, date, apple or orange; no tuber that ranks with the potato, yam, manioc or taro; and no quadruped that possesses the least value for milk, wool, burden or draft. The aborigines belong to the black or lowest of the three main races of mankind; and the result of the combination of scanty geographical resources with lowness of intellectual capacity was an extremely rude culture.

Sec. 4. *Tools*.—Man is by nature a tool-making animal. His peculiar mental and physical organization impelled him at the beginning of his human career to shape natural objects into tools, things valuable for use, and, in their highest forms, very valuable for oft-repeated use. By the variety of its designs, the frequency of its employment and the vastness of its influence on his mode of life the tool has become the most important product of the human mind and the most appropriate symbol of progress. With its aid, man has risen above the level of the brute; without it, he would have had no fire, no weapon, no clothing, no

house, no tillage, no useful art, no power of overcoming the large carnivores, and no state. He is the only maker of tools. The stone picked up by a monkey to crack a nut or the branch torn from a tree by an elephant to be used in brushing away flies is not a tool, but a mere natural object, not shaped by art.

The tool is a labor-saving device, and enables man to do quickly many kinds of work, which without its help he could not do or would have to do slowly. It is also the first permanent form of accumulated capital; it may remain serviceable for many years though used every day. The knife and the implements, which the savage shapes with it, including spear, club, bow, arrow, shield, fire-stick, mat and basket, are the most precious and durable pieces of his property.

Sec. 5. *Australian Industry*.—The first tool, frequently and urgently needed by man was a knife, and this he made by chipping stone, splitting bone or grinding shell to an edge. He found the kinds of stone which combine hardness with elasticity, and are therefore most serviceable for cutting purposes, and learned how to shape, grind and polish them. Thus he made scrapers, arrow-heads, spear-heads, chisels, hatchets, axes and adzes. Some of his hatchets and axes he polished; others he attached to handles, so as to increase the length and momentum of his blow.

All modern savages, before meeting white men,

understood the art of making fire by friction, either twirling the point of one wooden stick in the hole of another or rubbing it in the groove of another until the heat was sufficient to kindle tinder. The kindling sticks known to modern observation were shaped by knives; and we may infer that the art of taming fire is later than that of making stone knives. Without the knife there would have been no other tools of much value; without kindling sticks there would have been no cookery, no pottery, no metallurgy, no machinery, no clearing of forests, no occupation of the temperate zone by man.

Among these industrial products of the aboriginal Australians besides stone edge tools and fire-sticks, were thread, nets, mats, baskets, canoes of bark and of hollowed logs, paddles, fish-hooks, digging-sticks, dressed skins and rude huts. They domesticated the dog, but no bird or herbivorous quadruped. They had no cloth, pottery, cooking utensil, cultivated plant or metallic tool. Their only methods of cooking were broiling, roasting and baking, for the last-named process using pits in the earth. Their tools, weapons, clothing and furniture were so scanty that they could carry all of them in one load when they changed their residence, as most of them did a dozen times or more in a year. Having no stock of provisions to last more than a day, they collected their food when they were hungry; and,

after exhausting the supply in one place, moved to another. Most of them had no huts, but mere shelters entirely open on one side, made by a person in an hour or two. From generation to generation they accumulated nothing.

The primitive savage discovered the nutritious quality of nearly every vegetable and animal fibre now used as food by man. He ate tubers, seeds, fruits, nuts, barks, stems, piths and saps of plants and the tissues of mollusks, worms, reptiles, fishes, birds, quadrupeds and men. He devised methods of extracting the poison from many substances in which it was mixed by nature with valuable nutrient. He was not squeamish in his diet. Neither the odor nor the flavor of decay or filth offended him. Maggots, ants, gnats, worms, parasitic insects, rancid blubber, putrid meat and unwashed intestines were welcome to his palate and stomach and in many cases were even counted as delicacies. He broiled his meat by laying it on live coals or by holding it over the fire on the point of a stick, and he also baked his meat in a pit with a layer of red hot stones below and above, the whole covered with a layer of earth.

Sec. 6. *Australian Polity*.—The political community of the Australians was not a nation nor a tribe but a group which comprised a small number of persons, who might be counted by scores, sometimes not even a single score, and had no systematic government, nor even a chief holding

by hereditary right or formal election, though some one man or several men acting in concert might have a predominant influence. With an area of about 3,000,000 square miles, the Australian continent had perhaps a hundred linguistic districts, each averaging 30,000 square miles. Every district comprised a number of groups, which usually had perhaps sixty-five persons, and each group usually had its dialectic peculiarities, though the inhabitants of a linguistic district could make themselves intelligible to one another in a single conversation by speech and also by sign language. The relations between different districts were usually hostile and a wide belt of land along their borders was left uninhabited. Warfare often prevailed between groups of the same district; and as a general rule, the Australian killed every stranger whom he found in his power. He regarded as an enemy every man outside of his group, and in many districts cannibalism was practiced whenever any person of another district or of a hostile group was slain. Of course the results of such a practice, were general distrust and chronic warfare, peace and confidence exceptional.

Every adult male was a warrior and he habitually carried his spear or club,—the bow was not used in Australia,—not only for ordinary game, but in many regions for human game. In unfavorable seasons when there was not food enough for

all, the weaker groups if not slain and eaten were driven away from the places where quadrupeds, birds, fruits and tubers were most abundant. Cannibalism was a motive or an accompaniment of many wars, and was stimulated by a superstition that by eating the heart, eye and arm, the victor added the powers of those organs to his own.

As there was no hereditary or elective chief, so there was no authoritative head of the group, no orderly administration of justice, nothing but the violence of the strong and the oppression of the weak. If a husband killed his wife or a parent his child, others did not interfere. Two or three of the braver and more active men did nearly as they pleased and the others in the group submitted.

Six political principles were prominent in the primitive group; first, protection of its members against outsiders by retaliation; second, lineage traceable exclusively in the female line; third, prohibition of marriage between persons of the same lineage; fourth, the bondage of the women; fifth, the division of the men into the privileged and the unprivileged; and sixth, infanticide for the three purposes of limiting population, of having a decided majority of males, and of preventing the women from caring for more than one helpless child at a time.

The law of retaliation provided that an injury

done to any member of a group by an outsider must be avenged by the offended group, and by every member of it at the first opportunity, and that the person who failed to take this vengeance should be treated as a traitor, and driven out, if not slain. Every member of the offender's group was as much responsible as the offender in person, and the punishment, at least equal to the harm first done, must be inflicted, even if the original offense was accidental or unintentional. When there were no orderly courts of justice, distinctions between justifiable, and unjustifiable injuries, between accidental and intentional homicides, could not be drawn, and therefore the rule was an eye for an eye, a tooth for a tooth and a life for a life.

The main purpose of this system of avenging injuries was to maintain the fighting force of the group, which last, if it lacked spirit to defend itself, would soon have been destroyed. Neither the killing of a child by its father, nor the cruel beating of a woman by her husband was considered a proper occasion for the application of the system of vengeance by the group, but the murder of the wife or even a severe wound inflicted on her was sometimes punished by her brothers. The principle of female lineage had its origin presumably in matrimonial discord. When brothers and sisters lived together in the same primitive group, the brothers sometimes protected the sisters against the brutalities of husbands, and

this interference led to dangerous and destructive discord. A method of escaping from these evils was found by adopting the rules that blood should be traced only in the female line, and that persons of the same blood should not marry one another. The results of these rules were that the adult brother did not make his home in the same community with his married sister and usually had no opportunity to know anything of the cruelty inflicted on her by her husband.

Sec. 7. *Australian Sociality*.—Most of the Australian blacks trace their pedigrees exclusively in the feminine line and claim that they are all descended from several scores of female ancestors, who were not women, but brutes, plants or meteorological phenomena. Among these class mothers, or totems, are a kangaroo, a kangaroo hare, a kangaroo rat, an opossum, a flying fox, a duckmole, an emu, a swan, a crow, a parrot, a eucalyptus, an acacia, snow, lightning and thunder. Every person knows the name of his class mother or totem, and regards marriage or sexual intimacy with any descendant of that mother as a great wrong. Groups, whose territories are 1,000 miles apart, have in many cases the same totems, and though they do not understand each other's speech they can converse by signs, and usually one of their first questions after meeting a stranger is "What is your totem?" If a man and woman who have never seen each other before, find that they have

different totems, and belong to classes that may intermarry they at once address each other as "husband" and "wife."

The sacredness attached to the maternal lineage becomes more impressive to us if we consider that in many cases, two persons who had not more than one per cent of the same blood derived from the mother's side could not marry; and yet there would be no objection to the marriage of another couple who had the same paternal grandfather, and therefore had one fourth of the same blood.

The system of feminine pedigrees prevailed among most of the American tribes north of Mexico in the time of Columbus, and although it has not been found in Asia, Africa, or South America, all those continents have or in the past had usages that seem to be remnants of its influence. Thus in many countries property and rank pass, or, in historical times, have passed by inheritance not to the son of the dead man but to the son of his eldest sister. The law of Athens in the time of Solon permitted, and that of Madagascar now permits, a man to marry his half-sister, his niece, or his aunt on his father's but not on his mother's side; and a similar rule prevailed at one time in Judea, for the Pentateuch says that Abraham and Moses married their half-sisters on the father's side.

When first observed by civilized men, some savages had practices nearly akin to matrimonial

communism, and others had terms of relationship indicating vague ideas of paternity. They had no words for uncle, nephew, or brother-in-law, and the child gave the name of father to every man in the village. They had no such words as husband, wife, and chastity, and no term implying sexual exclusiveness. Promiscuous relations were common.

The women were treated as property by the men and were the greater part of the exchangeable property of the country. The wealth of a man was measured by the number of his wives and unmarried daughters. The latter he could trade off for more wives. The women did much of the drudgery and the more a man had of them the easier life was for him. When he died, his adult brother or son inherited his women, and if he left no adult brother or son, the other men of the group took them. All the children were born free but the mothers were practically slaves.

A minority of the men were a superior class and possessed privileges which they protected against the competition of the inferiors by restrictive laws, which were reputed to be of sacred origin. Women could not eat the most palatable and nutritious kinds of food without great sin, and boys were subject to similar prohibitions. Although some communistic ideas and practices in regard to the possession of women prevailed extensively, yet in certain portions of the continent

the dominant class adopted a peculiar method of protecting several of their privileges against competition. They deprived some of the young men of the power of leaving progeny, without however diminishing their military value or taking away their fondness or attractiveness for women. In the extensive regions where this custom prevailed, the children were all the offspring of the men of the dominant class who were supposed to possess superior courage and strength. Thus we see that social inequality made its appearance among the rudest savages, before orderly governments were established, before the separate ownership of land was claimed by families or individuals, and before accumulated wealth had been displayed in elegant dresses and dwellings. The inequalities of the Australians were extremely cruel, and they meant more degradation and suffering to the majority of the people than do the inequalities in any modern civilized nation.

About the beginning of the XIXth century, Malthus gained a great reputation by a book the main purpose of which was to call attention to the fact that prudential restrictions were needed to prevent the overcrowding of the world by human beings whose numbers increased more rapidly than the food supply under ordinary circumstances. Rude savages however whose food supply, before tillage, did not increase in the least from generation to generation, understood the

need of prudential restriction and applied it practically. Knowing by experience how many people their territory would maintain in unfavorable years, each group had what might be called its normal number, and any excess was prevented by leaving a number of infants to die immediately after birth, and before the mothers had become attached to them by allowing them to take nourishment from the breast.

Infanticide was universal in aboriginal Australia. Its main purpose was to limit the number of persons in the group, but it was usually managed so that there should be two males to one female,—this was to give the largest fighting capacity possible to the group,—and the infants to be sacrificed were selected so that the group should always be able to travel expeditiously, and therefore the mother must not be bothered with the care of more than one child under four or five years of age. The girls were all married before fifteen and the child born when the mother had not reached her full growth was, as a rule, not saved. Many women did not try to raise more than one in three, some not one in two of their offspring. The sacrifice of the others was demanded by custom as much preferable to its alternative,—the starvation of an equal number of adults in seasons of drought.

The average brain of the Australian savage is about one fifth smaller than that of the enlight-

ened European, seventy-three as compared with ninety-three cubic inches, and its convolutions are fewer. His mind is precocious but reaches its full development before he is out of his teens. In many respects he remains through life like a child, thinking only of the present, demanding immediate gratifications, giving way to the suggestions or passions of the moment, laughing and crying easily, passing suddenly from one extreme of feeling to another, from one train of thought to another, and from one opinion to another without perceiving strangeness or inconsistency in his conduct. He is a creature of impulse, with "the passions of a man and the reason of a child"; with "the incapacity of infancy and the unliancy of old age," as Lubbock says.

His mind is highly alert in observing his game and watching his enemy, but is dull in noting its own processes of thought or conceiving abstract principles. He finds difficulty in explaining the motives of his actions and the reasons of his opinions. When questioned about such matters he is not merely bothered, his mind seems to be oppressed. Dr. Pickering of the Wilkes Exploring Expedition said that among all the savages whom he had studied, he had found none except the Fijians with whom he could maintain a connected conversation that was instructive to him.

Having neither books, nor habits of study, nor intellectual amusements, nor good artificial light,

the savage, especially in the tropics where the nights are at least eleven hours long, learns to sleep through ten or more hours, and usually goes to sleep easily and quickly. Negro children in the United States inherit drowsiness from their African ancestors; and not unfrequently the mothers compel them to stand up at the table to prevent them from going to sleep before finishing the meal.

The rudiments of ethical feeling are plainly observable among the brutes, which have maternal affection, friendly attachment, self-sacrificing devotion, gratitude, resentment and many other passions similar to those of human nature. The wide difference between the lowest men and the highest apes in the strength of moral sentiment is probably due in a large degree to the much longer duration of infancy in one race than in the other. Man is distinguished from all other mammals by the helplessness of his early years, by the length of his suckling period, by his dependence on his parents for food through years after the close of lactation, by his slow advance in physical and mental maturity, by the great amount of time and attention which the mother must give to her children, by the necessity imposed on the father of assisting and protecting the mother; and by the maintenance of life-long matrimonial, parental and filial attachments.

These characteristics of the human family are

the sources of much of our ethical feeling. The mother loves her child because she has cared for it through many years, and has become accustomed to its companionship, and has learned its lovable character; and the child returns the affection which it observes and appreciates. The love is mutual; it extends to other relatives; it is enlightened by knowledge; it expands till it includes neighbors and fellow villagers. For the non-tilling savage, the limits of ethical obligation were his group and his pedigree. Outsiders were his presumptive enemies; even if not hostile, they were at best indifferent to him. They had no claim upon him for such protection as he owed to his fellow group-members whom he was bound to defend and avenge, as they were bound to do as much for him.

The formulas of politeness are products of experience. When defiant before an enemy, the savage held his spear or other weapon ready for immediate use, expressing hostility in his attitude. When conquered, he dropped his weapon and knelt or lay down. Upon meeting a superior of his own tribe he bowed low or knelt, and showed his humility by dropping dust on his head, or by kissing the hand of the man whom he wished to honor. Hand-shaking is not a savage custom, but it undoubtedly had its origin in the savage custom of hand kissing, as a compromise when neither party would allow the other to kiss his hand.

Some of the chief requirements of modesty now accepted by all enlightened nations are conventional. In many tribes, clothing of any kind was forbidden to married women and in others to young girls; and in various regions the only habitual dress for girls and women was a narrow girdle with a fringe not more than three inches long. Even in countries where clothing was necessary for comfort during much of the year, nudity was not considered immodest; and many acts, reserved in civilized countries for the strictest privacy, were done publicly.

To the tropical savage, ornament was more important than clothing. He oiled his body, painted it, stained it, tattooed it, scarred it with lumps that might be as thick as his finger, broke out some of his teeth, or filed them to points, according to accepted patterns, for the purpose of giving notice that he belonged to a certain tribe or class, that he had killed an enemy or a number of enemies, or that he had reached adult age. In some tribes fashion required or permitted the boring of a large hole in the septum, the wing or the bridge of the nose to hold a ring or a stick; in others the ears were loaded with rings till they stretched out to twice their natural length; and in some the lips, upper, lower, or both, were cut through and in the openings, bungs, rings, studs, or sticks were placed, in manners highly inconvenient to the wearers and disgusting to enlightened observers.

Sec. 8. *Animism*.—The religion of the Australians is Animism, a belief in and fear of ghosts, the spirits of dead men, which possess and often exert the power to hurt the living, into whose bodies they enter and gnaw their vitals, causing pain and death. An ache of any kind is attributed to a spirit directed by a sorcerer. The spirits are entirely immaterial, but do not live forever; they are supposed to die after a score or two of years. They remain in the neighborhood of the places where their bodies dwelt, and when intent on harm, they rarely or never do a beneficent act,—they usually select the night for the time of their action. They may be induced to abstain from evil by methods of propitiation devised by sorcerers, who receive pay for their services. The spirits have neither extensively known personal names, nor special functions, nor special devotees, nor continuous residence in any natural or artificial object nor exclusive favor for any person or class of persons. They are generally unidentified spirits, and are conceived very vaguely. Of an ancestral god, a national god, or a universal god, the aboriginal Australian knows nothing more than he has learned from white men.

The Australian savage often suffers much from hunger, and then has numerous and highly vivid dreams, which he imagines to be recollections of the adventures of his soul while absent from his body. He infers that his spirit can live without

the body and survives after its death. Having no conception of scientific law, he does not know where to draw the lines of actuality, and accepts conceptions of his fancy as established truths. He believes in imaginary personages and supernatural events. Pain, disease and death, instead of being the results of disturbance of the functions of material organs, are for him caused by the entrance of malignant spirits into the body. Most of the living men, of whom he knows something, are his enemies; and therefore the majority of the dead, carrying their feelings into the other world, are hostile to him, and are predisposed, when favorable opportunity permits, to attack him, to sneak into his vitals, and there gnaw until they kill him. He expects after his death to attack his enemies in that way, and he assumes that if he has any enemies who know where to find him, they will treat him in the same manner. The spirits, as he conceives them, stay at home, wherever that may be, in the day time, but in the night, when dreams are active, they roam about seeking whom they may devour. He therefore dislikes to venture out in the darkness; and if he must go he carries a flaming brand; and while asleep, he keeps a fire in front of shelter to scare away the ghosts. The spirits of men of his own group, and of groups with which his own has had amicable relations, are considered friendly unless offended by some special act, such as treating the corpse

with disrespect or neglecting to avenge its wrongs, such as the witchcraft by which a hostile spirit was assisted to cause the death. The belief in demoniac possession was accompanied by that in the sorcery which in many cases led to the entrance of the evil spirit into the body, and in the ability of other sorcerers to discover the one who was the cause of the disease or death. An Australian wizard, conducting funeral ceremonies, said to the people collected round the corpse, "the dead man has promised that if his murderer shall be sufficiently avenged, his spirit will not haunt his group, nor cause them fear, nor mislead them into wrong tracks, nor bring sickness among them, nor make loud noises in the night." This little funeral oration suggests many of the religious ideas of the rudest culture; that the spirit was malignant rather than benevolent; that it would do harm if not conciliated, and would not do good in any event; that it held the whole group responsible for discovering and punishing the group guilty of causing its death; and that on such a solemn occasion there was no need to mention any happy future for the soul or any higher spiritual being than the spirit of the deceased. Man has always made God in his own image, and the primitive savage not only deified humanity but knew no other deity.

 In this Australian funeral there were two prominent characters; the offended spirit, and the

mediating sorcerer. The latter claimed to be the authorized agent of the divinities, to communicate with them directly, and to undertake the art of propitiating them. He told the mourners how to discover the group to which the hostile wizard belonged, perhaps by dropping a bug on a mat which the dead man had used, and observing the course taken by the bug when frightened. That direction pointed to the guilty group, and when one of its members was slain the offended spirit was satisfied. An imaginary deity, an imaginary sin, a pretended revelation and a sacerdotal fraud are the main constituents of this primitive superstition which represents the root of all other religions. Whether fear is the mother of devotion generally or not, it certainly was in this case.

The Australians treated the corpse with respect proportioned to the military value of the deceased, giving little to the child and the woman and much to the brave and active man. Some groups burned their dead, and others placed them in trees. The near relatives cut off their hair; the women cut gashes in their scalps, faces and legs, and with the blood smeared leaves which they placed before the corpse in the grave. The blood was to feed the departed spirit; and the broken spear was put in the dead man's grave or over his final resting place. After a few days the group left the neighborhood, and the relatives took no farther notice of the corpse.

Sec. 9. *Australian Review*.—We have now considered the main points of our information about the Australian culturestep, the lowest known to history. Its Industry was so rude that it had neither metallurgy, nor pottery, nor weaving, nor pasturage, nor even tillage. All its food was furnished by wild plants or wild animals. Its Polity had neither an orderly public council, nor a hereditary or elected chief nor even a tribal organization. Its political community was a mere group. The women were treated as property and there was much inequality of privilege among the men. In social relations blood was traced only through the mother. No moral obligation was felt towards a member of a distant or unknown group, and little towards one of a neighboring group. The spirits of dead men were the only gods, and were not regularly worshiped. Several centuries ago, the lowest step of culture prevailed in Tasmania, the Andaman Islands and part of California, as well as in Australia.

CHAPTER II.

THE IROQUOIS STEP.

Section 10. *Iroquois Industry*.—As Australia is the typical land of the wild-food or non-tilling step of culture, so the country east of the Mississippi river is that of the next, the scanty-tilling, or Iroquois era. The last name is suggested by the fact that the Iroquois confederation played a very prominent part in the aboriginal life of that region. The fields were planted and cultivated by the women or squaws, and the amount of land cultivated was relatively little.

Before learning to till the ground, many savages depended for some of their food on wild tubers, obtained with the help of a digging stick, which was a primitive spade and, in its best form, was five or six feet long, three inches wide, and except at its sharp ends, two inches thick. The loosening of the ground facilitated the new growth, and the observation of this fact presumably led to experiments in tillage which proved successful; and thus agriculture, one of the most important of the useful arts, had its origin. The digging stick was a woman's implement and its use was beneath the dignity of the warrior. She

had many other things however to demand her attention, so her field and her crop were relatively small; but in the course of centuries she learned much and domesticated and improved maize, sweet potato, yam, bean, pumpkin, squash, melon, gourd, sunflower and tobacco, in the East-Mississippi region. In the country east of the Andes, she cultivated maize, manioc, yam, plantain, bread-fruit and tobacco.

The introduction of tillage into human life greatly influenced industry generally, and also other branches of life. It increased the food supply and gave it greater regularity, fixed the residence of the community, surrounded the village with a palisade, gave greater density to the population, enlarged the residence, demanded more furniture and a larger stock of tools, led to pottery and weaving, established an ownership in land, differentiated occupations and encouraged the habit of exchanging the products of labor.

While working with a stone axe, the savage found that the most expeditious way to cut wood was to burn it a little, then chop away the charred portion, burn again and so on. He restricted the action of the fire by covering part of the wood with wet clay and then discovered that by putting a layer of clay over a gourd or basket he could make a water-tight vessel in which water might be boiled. Such clay-covered vessels left on the fire till the water all went off in steam, were con-

verted into crocks by the burning of the gourd or basket and thus, it is supposed, the art of making pottery had its origin. Many of the early pots were moulded on baskets before men learned that the clay could be made to retain its shape without the help of such a support.

In its origin, weaving was later than tillage, and was unknown to the aboriginal Australians. It never reached much importance in scanty tilling communities; they depended for most of their clothing on skins and, in tropical countries, they could make a kind of cloth with less labor out of bark. The primitive method of making woven cloth was by finger weaving,—that is by passing the weft, or transverse yarn, with the fingers between the stretched warp, a very slow process.

Boats were relatively rare among the non-tilling peoples. The first vehicle used by man for navigation was a log or bundle of reeds on which he sat astride, using his hands for paddles. The next one was two logs or a larger bundle of reeds or canes on which he could stand using a paddle. The earliest boat was a hollow log with blunt ends; a better one had sharpened ends. In the basin of the St. Lawrence serviceable and very light canoes were made of birch bark with little labor.

The Iroquois surpassed the Australian as a maker of tools, because in tilling his field and building his palisaded village, he had more use for

them. His permanent residence, under the shelter of a fortification, enabled him to keep property securely and gave him a motive for accumulation. He frequently, as the Australian rarely, polished his stone axe or hatchet; but the polish added little to the practical value and has no importance as a measure of culture.

The aboriginal Americans of the region east of the Mississippi had no tame animal except the dog. They had pet birds and quadrupeds occasionally but never bred them in flocks or herds. The turkey, grouse, pigeon, goose, duck, swan, buffalo, elk, moose, deer, antelope, and perhaps also the mountain goat and sheep, were abundant in or near their country, and most of these might have been domesticated with much profit, if the Indians had possessed large enclosures, and stocks of food for the winter, and horses with which to drive herds, and extensive regions secure against the plundering incursions of hostile tribes. But under the conditions prevalent east of the Mississippi in the time of Columbus, the acquisition and management of a herd of large ruminants would have been beset with many great difficulties, even if the possession of such a treasure would not have provoked attacks by all the neighboring tribes.

The culturestep of scanty-tillage prevailed extensively west of the Mississippi river as well as east of it, and also in the eastern part of South

America, and in those regions also herds of tame animals were unknown.

Sec. 11. *Iroquois Polity*.—By building permanent fortified villages and increasing the density of the population, tillage greatly influenced the polity of the rude savage. It led neighboring villages into alliances for mutual protection, compelled them to change these alliances into permanent unions or tribes, made demands for permanent chiefs and orderly councils, and converted all the dwellers of a village into the members or adherents of a single clan.

The savage clan, which we now meet for the first time, is a small political community, always exogamous (that is finding spouses outside of those born within its boundaries), and therefore unable to perpetuate itself or to maintain an independent existence. It is invariably a part of a tribe or combination of exogamous clans, and its members seek their spouses in the other clans of their tribe or federation.

There are two kinds of savage clans,—the feminine and the masculine, the former tracing its blood exclusively through the mother, and the latter through the father. Every member of a feminine clan was considered to be the descendant of one ancestral mother, and a boy born in the clan could not marry one of its girls, no matter how remote the relationship,—which as it came only through the mothers could be traced for

many generations; and so children born in the same masculine clan could not intermarry. Every tribe was composed exclusively of either feminine or masculine clans; and the feminine clan was undoubtedly the older organization. It existed in the great confederations of the Iroquois, and the Muscogeees or Cherokees, the two greatest of the political organizations in the region east of the Mississippi when first known to the Europeans. The league of the Iroquois endured for three centuries; that of the Cherokees probably as long.

The feminine tribe, or tribe composed of feminine clans, was the natural result of the proximity of small agricultural communities which traced their descent in the female line. Military necessity compelled them to unite their forces, and suggested the formation of a permanent tribe, which could not separate after each village became an exogamous clan, dependent on its associate villages in the tribe for its husbands. When the combination had been formed it could not be broken. No tribe was exogamous.

The Iroquois clan had frequent meetings of its warriors in an orderly council under the presidency of its elected civil or peace chief; and it also had its elective war chief who was the leader of its men in war, with little authority however to command the obedience of his warriors. The battles were skirmishes; the highest ambition of

the savage was to take his enemy by surprise and kill him without danger to himself. There was a privileged class of men among the Australians; there was none among the aborigines east of the Mississippi; all men of mature years were warriors and all had or were supposed to have equal civil, political and military rights, except that some were promoted to chieftainship by the vote of the warriors.

The highest allegiance of the Iroquois warrior was due not to his confederacy or to his tribe but to his clan,—after his marriage to his adopted clan,—which succeeded the group as the defender of his person and the avenger of his injuries. As the clans could not stand alone, they never separated, and yet often had serious quarrels because of injuries done to their members. There was no slavery for adult males, because slaves could not be guarded or trusted while hunting, and all the men were freemen and warriors, that is all who passed successfully through the ceremonies of initiation in which they were subjected to the tests of hunger, thirst and cutting of the flesh so cruel that it seems almost incredible to civilized people that more than ninety-five out of a hundred of the redmen east of the Mississippi should have endured such tortures with success.

The feminine tribe always had a weak military organization. Its warriors were men who as boys had belonged to different villages, and had been

trained by different chiefs. Under it, the married son did not fight by the side of his father; and brother was often separated from brother. The strong bonds of life-long association were wanting. The warrior owed his highest allegiance to his wife's clan which he did not enter until he reached the years of manhood, and which he might leave if his wife died, and in many cases this clan was one against which, as a youth, he may have had serious grievances; for there were many quarrels between clans. These conditions prevented the feminine clan from developing high military discipline.

The weakness of the feminine clan led to its overthrow. A masculine tribe,—a tribe composed of masculine clans, in which descent was traced through the father,—made its appearance, and was a success. The sons fought by the side of the father, brother was associated in the battle-field with brother, and friends of childhood with one another. In the crucible of war the feminine clan proved to be the weaker, and therefore it disappeared, to make way for the masculine clan. This was the normal course of political development, but it is not clearly traceable in history. Among the Indians north of Mexico, most of the tribes were feminine, and those which had the masculine organization showed, so far as we know, no superiority of military strength; but the struggle between the two systems was interrupted by the in-

vasion of the white men and by the collapse of the aboriginal communities.

The term matriarchate has been applied to the feminine clan but without historical justification. The women never ruled in any savage tribe of which we have much information; their ownership of the property in some American tribes was nominal rather than real; they never had control of a government; they never raised themselves to a social dignity approaching that of the warrior. In all ages and countries, woman has been the victim of political and social oppression, and nowhere was her condition worse than among the aboriginal Australians. As a general rule it may be said that the higher the culture, the less the injustice to woman. Among the redmen east of the Mississippi, the feminine tribe reached its highest development. The squaws were nominally the owners of the villages, the fortifications, the furniture, the houses, the fields, the agricultural tools and the stocks of provisions, and nominally too the wife had the authority to divorce herself.

When the masculine clan was established, then the wife moved to her husband's village, he bought her, and she became his property, and his domestic animal. He insisted that her children should be his children; he required her to be faithful to him, while he made no pretense of faithfulness to her. He could have as many wives as he could buy. His idea was that though the man is for

many women, the woman is for one man; and there was much excuse for this rule in communities where a large proportion of the men were slain in warfare, and where the mother,—having no milk-yielding quadruped,—suckled her child three or four years, and during so long a time was separated from her husband. Among savages there were no old maids; every young woman had a husband before reaching the age of sixteen.

Sec. 12. *Iroquois Sociality.*—The higher industrial and political conditions, the fixed residence, the fortification of the village and the increased density of the population accompanying the development of tillage had a stimulating influence on the social relations. The bonds of allegiance and moral obligation expanded with the size of the community. People were brought into more intimate association and rendered more dependent on one another. The conceptions of ownership and its rights and duties enlarged with the possession of fields, of hoarded food, of permanent villages and of increased stocks of furniture and tools.

Sec. 13. *Fetishism.*—As industry, polity and sociality advanced to higher forms in the second era, so did religion. The highest god, among the aboriginal Australians, was a malignant spirit who had no permanent place of residence and was not the special guardian of any person or community; among the Iroquois, he was a beneficent spirit who

dwell in a fetish home, and was the exclusive divinity of a warrior. The savage had advanced from animism to the next higher ecclesiastical system, in which the god dwells in a fetish, a natural or a rudely shaped object, usually a small one, in the possession of one worshiper of whom he is the exclusive guardian. Fetishism resembles idolatry in many points, but differs from it in having a ruder home for the spirit, often a smaller one, in not having a name for the divinity, and in limiting the divine favor to a single devotee. These two ecclesiastical systems are alike in making a clear distinction between the spiritual being and his material dwelling place.

The god of the Iroquois was the spirit of a brute, or of a man who had taken possession of a brute, the skin of which the worshiper could carry with him always, without serious obstruction of his movements. This god was his personal secret; and its material fetish was often concealed under his clothing. He had no public name for it, and it was not a subject of conversation with strangers. He had no form of devotion to it, nor did he ever worship it in the presence of his friends or family.

Before reaching his eighteenth year, the Iroquois boy chose his fetish god by going off into a solitary place, and fasting till he dreamed or thought of an animal that seemed to him suitable for his guardian divinity. After returning to his

village and satisfying his hunger, he started off to hunt the selected animal, which he killed and with its skin or part of it prepared a fetish pouch or medicine-bag into which he put some dry grass or moss, and which he regarded as the home of his god. This bag was his most precious possession, never sold, given away, willingly abandoned, or exchanged. If he lost it in battle as sometimes happened, he could not replace it, except by taking one from an enemy whom he had slain; and he could appropriate all the fetish gods, the bags of which he could get in this manner. Otherwise he was limited to one only. Before engaging in any difficult enterprise he prayed to his fetish for aid; after success he returned thanks to it.

This fetish, manitoo, or "medicine," as the trappers called it, was the highest divinity known to the North American savage. He had no family, nor tribal, nor territorial, nor universal deity; no class of priests devoted to the worship of any god or company of gods. He venerated the totem of his clan, and honored it in an annual festival; but the totem was not a god and its festival was not worship. He had his initiation or Sun dance, his War-omen dance, his scalp dance, his bear dance, and his buffalo dance, but in these no god was mentioned, nor was any one special divinity suggested or meant as the object of devotion.

The Iroquois never worshiped the spirit of his deceased father or chief; he had not advanced so

far as ancestor worship in his religious development. He believed that the soul lives after the death of the body; he distinctly recognized the divine character of the soul that has left the body; he honored it by his scrupulous care of the corpse, and by making offerings to the spirit at its home where the body was buried, burned or placed. The life of the soul after the death of the body was conceived by him to be a continuation of existence in the flesh, with the same physical and mental wants, the same occupations and passions, the same hunting and fighting, and the same need of food, drink, clothes, tools, and weapons. The person who died when very old, or deaf or blind or maimed carried his infirmity with him, and could never be healed there more than he could here. The life was not immortal; it lasted for several scores of years; and people were killed off there as here. According to the belief of many tribes, the soul of the man that was scalped never reached the land of spirits. The other world was not associated with the idea of divine government; with the punishment of wickedness or the reward of virtue, or beatific vision of any divinity.

The Iroquois, following the example of the Australian, slashed himself and gave his blood to feed the departed spirit, thus indicating that cannibalism had left its impression on ecclesiastical usage. He also gave other kinds of food, and, unlike the Australian, continued for months or years to feed

the spirit. At the grave he slew the warrior's dog, left his broken lance, bow and arrows, skins for clothing, and other things. The food, dog, weapons and clothing had spirits as well as the man, and, when placed near his remains, his soul seized and appropriated them and took them to his new abode. By breaking the lance its spirit was liberated as the soul of the man was freed from the body by a mortal wound.

The fact that the Iroquois did not worship their deceased fathers and grandfathers may be explained by the general prevalence of the feminine pedigree in most of the tribes and the relative novelty of the masculine descent in the others. Ecclesiastical observances adapt themselves slowly to political and social changes in low culture.

Many authors have made the mistake of asserting that the aboriginal Americans of the region east of the Mississippi believed in a God who was the Creator and Governor of the world, but the name given to this divinity was "the Great Spirit," a term put into their vocabulary and thought by the white men and never adopted and assimilated by them. Such a deity had no name in the Red-man's language, no place in his worship, no priest and no festival. When the Indians of the plains in the basins of the Missouri and Arkansas rivers wanted to convey the idea of the Great Spirit in the sign language they usually made gestures meaning "the white man's medicine," that is, the white man's God.

Those authors who have written most clearly about the religious ideas and observances of the aboriginal Americans east of the Mississippi as studied by themselves, have nothing to say about the Great Spirit or at least give it no prominence, thus indicating that the idea had no prominence in the thoughts of the red savages. Besides we know that there was no common or nearly related word in the different languages to express the idea, as there must have been if there had been an extensive acceptance of such a divinity. Such related words to mean a great god will be encountered among the Polynesians, in a higher step of culture. Moreover, the fetish divinity and the Great Spirit are not reconcilable; where one lives, the other dies. The ancestral precedes the national, and the national precedes the universal god in the order of ecclesiastical evolution; but neither of these predecessors was known to the Iroquois. All the evidences, direct and presumptive, indicate that nothing was known to the aborigines east of the Mississippi about the Great Spirit except from the teaching of the white men.

Among the Iroquois, as among the Australians, the priest or sorcerer, the man who pretended to communicate with the supernatural powers, was a prominent character. He claimed ability to check floods, storms, droughts, famines, and diseases; he interpreted omens as to whether projected military expeditions would succeed or fail; he

managed dances, festivals and funeral ceremonies, and was an influential personage. As there was no god of a tribe, clan or family, so the Iroquois priest, in his dealings with the community, acknowledged no fealty to any special divinity; he represented the divine powers generally. Disease, according to him, was a possession by evil spirits, and his treatment of it was, in many cases, based on the theory that by subjecting the sick man to unpleasant odors or frightful noises the demons might be scared away. Sometimes he sucked the place where pain was felt and then produced a little stone, or bone, which he said he had taken out.

Sec. 14. *Iroquois Review.*—The most important feature in the advance from the First to the Second Step of culture was the introduction of tillage which increased man's food supply, enlarged his group, fastened it down in a permanent village, protected it by a fortification, compelled it to combine with other groups in a tribe, and by creating the idea of property in land, giving regularity to habits, and increasing the feeling of security, prepared him to believe in beneficent divine beings, the faithful protectors of their worshipers. Here Industry appears as the first factor of progress.

CHAPTER III.

THE POLYNESIAN STEP.

Section 15. *Polynesian Industry*.—From the region east of the Mississippi river, where we studied scanty tillage among the Iroquois and kindred tribes, we must now turn to tropical Polynesia, where the next higher culture step, that of Extensive Tillage, prevailed, reaching its highest forms in the Hawaiian, Tahitian, Samoan and Tongan islands, which have an aggregate area less than that of a district a hundred miles long and seventy wide. Besides being small, these islands have isolated positions in the Pacific; Samoa and Tonga being four hundred miles apart; both of them 1600 miles from Tahiti; each of the three 2000 miles from Hawaii; and each of the four at least 1500 miles from the nearest continent. Not only are they the most isolated portions of the globe, but they are also poor in natural resources, having no cereal or herbivorous quadruped among their indigenous productions, no clay suitable for pottery, no valuable ores, and no rich fishing banks in the neighborhood. Their climate has a mean of more than 75 Fahrenheit in every month. And yet with all these disadvantages, their brown in-

habitants showed much energy in agriculture, boatbuilding, navigation, maritime and military adventure, and carried polity and religion to much higher development than did the Iroquois.

The differences between the mental development of these two peoples are suggestive. Both belonged to the same yellow race and were, it may be presumed, about equal in inherited capacity. But the regions which they occupied are different in natural resources; one small, isolated, tropical, with few valuable products; the other a hundred-fold larger, in the temperate zone, and rich in its minerals, plants, and animals, and yet the smaller and poorer region surpassed the other in culture. We cannot determine whether the Polynesians imported their arts and institutions from their ancestral home in Malaysia or developed them on their islands.

The tropical heat of their climate throughout the year relieved the Polynesians from many wants felt in the temperate zone. They did not need furs nor woolen garments nor pit-like houses to keep them warm. A common tree furnished a bark which could be beaten out into a cloth, resembling paper, that could be used for a light cloak. Their dwellings were sheds rather than houses, with roofs to keep out the rain and open sides to permit the cooling breezes to pass through in every direction. They built large canoes that held a hundred men and sailed thousands of miles.

Sec. 16. *Polynesian Polity*.—In the First Era, the chief factor in progress was an industrial invention, the edge tool of stone; in the Second, it was another industrial invention, the art of tillage; in the Third, now under consideration, it was a political institution, slavery, which so stimulated tillage that it reacted on other branches of life and caused them to rise to higher developments. This culture step never existed, so far as we know, within the observation of civilized men, anywhere except in tropical Polynesia.

Some tribe or league of tribes conquered a rival community, killed off its men and compelled its women and children to toil in the fields. These children grew to be adults and had offspring who like themselves were employed in agricultural labor. The institution of hereditary slavery thus established expanded, and after a time exerted much influence in many directions. The masters finding that they were relieved from the toil of collecting food for themselves, devoted much of their time to the management of their property and to military exercises. They reserved the use of arms to themselves and their dependent freemen; they divided all the tillable land among themselves and established laws and customs, as guaranties of political and social privileges which they transmitted to their descendants. Thus they created a hereditary nobility, a new and highly important institution. They compelled their slaves to work

through all the daylight hours, and thus established the habit of regular toil which is necessary for progress and is extremely irksome to savages generally. When brought into contact with civilization, the aboriginal Australians, Tasmanians and redmen north of Mexico, even when kindly treated and carefully instructed and liberally aided in many ways, would not or could not work with the hoe, spade, or axe, or any other tool for ten or twelve hours a day regularly. They might stick to a task for a month or two, but then must have the relaxation of a rest and a spree for an equal period. Slavery was in many respects a curse, but it blessed mankind with steady habits.

The nobles having valuable property in their fields, slaves and stocks of food, saw the necessity of combining, for mutual protection; and they built up a consolidated state under a despotic prince. The exogamous clan, if it ever existed in Polynesia, was swept away as an obstruction to national progress.

Sec. 17. *Polynesian Sociality*.—Infanticide was not only permissible but compulsory among the Polynesians in 1750. It was regarded as necessary to protect the people against the danger of starvation. A rule prevailed extensively that a woman, not of noble rank, should not rear more than three children; and custom decided that the large class of infants born out of wedlock, that is to parents who had not agreed to enter into a per-

manent matrimonial relation with each other, should be exposed immediately after birth. In some islands where such checks did not sufficiently restrict overpopulation, the more cruel remedy was adopted of selecting detachments of superfluous persons who were put into boats and ordered to sail away and not to return under penalty of death. In such cases, the condemned were almost invariably lost at sea.

The Polynesians did not regard chastity as a virtue, and had no word for it in their languages. The princes and some higher chiefs demanded fidelity from their wives; other women were subject to few restrictions, except that they should have no intimacy with a man of lower social rank than their own. Thus, a noble woman was not permitted to have a commoner for a lover, nor could a free girl associate honorably with a slave man. Within the limits fixed by custom the women generally were very liberal.

Before they became subject to the fashions of the white men, the Polynesians were nude through childhood, and in their adult years on ordinary occasions wore no clothing except a girdle, or some other very scanty covering. Their skins were not blistered by the sun; and frequent exposure to its direct rays was considered necessary to health. To keep a child in the shade was to give it a weak constitution. A dark skin was a sign of energy and vigor. Custom demanded that the

face, body, arms, and legs of the princes should be covered with tattoo, which on all state occasions should be visible, unhidden by garments. A hundred years ago the Hawaiian nobles were as proud of the patterns punctured in their skins, as are now rich Parisian dandies of the cut of their coats and trousers. Although the Polynesians, like all other savages, believed disease to be a demoniac possession, which might be cured by a correct sacerdotal exorcism, they yet had many medicinal and surgical remedies, including purges, emetics, scarifications, cauterizations, and rubbings with red pepper, whereby the hostile spirits were made so uncomfortable that they would seek other abodes. Amputations and the searing of severed blood-vessels with red-hot stones were practiced. The kneading of the muscles was a common remedy for sprains, bruises, surfeits and dullness of appetite, and was in almost daily use among the Hawaiian nobles, who were probably indebted to it for their great physical energy and large size, the average height of their men having been over six feet and four inches, the largest class of men known to history.

All savages had vocal and instrumental music, and some simple airs in the minor (never in the major) key, with a small range of notes, an irregular rhythm and a frequent reiteration of the same succession of notes, producing monotonous effects. The musical instruments were rude in proportion

as the general culture was low, and most of them were constructed on the principles of the drum, pipe, guitar or trumpet. No air or instrument of savage origin has a place in a modern orchestra.

Sec. 18. *Polynesian Religion*.—Hereditary nobility gave birth to ancestor worship. It transmitted land, slaves, wealth and political power in the male line; it taught the sons to revere the memory of the father to whom they were indebted for their possessions, their privileges, and their military drill. The adoration of the ancestor appears to modern philosophy to degrade divinity to the level of humanity, but we should remember that animism and fetishism had no higher conception of the supernatural powers and conceived them as nameless and kinless. Ancestor worship gave permanence, harmony and dignity to the divinities; it sanctified the domestic fire where the offerings were made; it united the father and the sons in the adoration of the last head of the family to cross into the world of shades, it lent to the father while living some of the sacredness which he would have after death; and by making the sacrifices in the presence of the family, it gave uniformity to the ceremonies and clearness to the ideas of divine service. Every morning before commencing his own first meal, the male head of the family threw a bit or several bits of meat or other food into the fire as offerings to the nearest male ancestors, spoke a brief prayer soliciting

their guidance and protection, and declaring his devotion to them.

The spirit of a great conqueror was supposed to have ability to give efficient aid to all his worshippers. His descendants boasted their success gained through his aid. His successors on the throne advised their nobles to make offerings on his altar. They were exalted by his exaltation, and by the increasing extent of his worship. They established temples for him in different places; and regarded his priests as members of their police. Thus they started the most prominent of their ancestral gods toward the position, which he afterward attained, of a national god. A later idea was that of a divinity who had never been a man, who existed from all eternity and would live forever. Their priests taught a doctrine of a deity who created the world, and who in different portions of Polynesia was called Tangaloa, Tanaroa, and Kanaloa. Every island, every important occupation had its special divinity; the gods were innumerable.

The recognition of a national divinity and the practice of public or temple worship were associated in their origin, but we do not know which was the first in the order of time to make its appearance. One followed the other with little delay, and each served to strengthen the other. Both were unknown among the Iroquois and both were well established among the Polynesians.

The spirit of the dead man, according to a common belief, stayed for a few days,—perhaps till his flesh had disappeared,—with the corpse in the grave; and then moved to the dwelling of the eldest son or chief worshiper. Some ruling prince, or perhaps a noble, not satisfied that his father's soul while staying with the body should be without offerings, put a bench or table there to hold food, drink, weapons and ornaments: then covered it with a shed and put a custodian in charge of it to protect it from depredation. The table developed into an altar; the shed into a temple; and the custodian into an endowed priesthood, with daily prayers, hymns, rituals, and offerings of food and decorations. The food included sacrifices of living animals and men, the best of everything that pleased the palate. Men had at some time been slaughtered to feed the gods in all the Polynesian Islands.

Having no metallic tools, the Polynesians never learned to carve elegant idols, but in their temples they had rude imitations of the human figure in stone, solid wood and wicker-work, as residences of their gods placed above and behind the altar, so that they should see all the sacrifices and offerings. Whenever an animal was slain, a little of the blood was smeared on the face or lips of the idol. Oracles, or divine instructions for guidance of men in public or private affairs, were often given by priests while occupying the hollow space in the wicker-work idols.

Among the Polynesians as among the men in the lower steps of culture, morality was not a part of priesthood. The spirits and gods were conceived as being on the same level as the average warrior. Devotion to them implied no duties except those of a ceremonial nature. The ancestral and primitive national gods were made intellectually and morally in the image of their worshipers generally,—vain, jealous, capricious and hostile to aliens. They demanded no virtue in this life and promised no reward or punishment in the next. Even those Polynesians who believed in an immortal god, did not expect to live forever. Their souls were to have an existence in the land of spirits similar to that in this world, with similar wants, passions, occupations, successes, failures, triumphs and defeats, ending after a few scores of years in absolute extinction.

Although the Polynesian priests did not systematically teach the main principles of ethics, yet they had some ceremonial rules which may be considered as moral commands. By their taboo, they forbade the appropriation of sacred things, and thus private property might be protected against touch by any person but the owner. The mark of the taboo, in many cases a small bundle of leaves tied to the article, was held in high respect by the people generally. The extent and complexity of the taboo system indicated that it had grown through many centuries.

Sec. 19. *Polynesian Review.*—The immediate cause of the advance from the Second to the Third step of culture was the establishment of slavery, which gave birth to extensive tillage and the two largely increased the food supply, made population dense, consolidated tribes into nations and furnished a basis for hereditary nobility, which traced blood in the male line, led to the worship of ancestors, and thus prepared the way for converting the spirit of a successful warrior prince into a national divinity. Industry and Polity are here combined as dominant factors in culture.

In considering the cultural condition of tropical Polynesia, we must remember that its area is very small, and very poor in natural resources, having neither an indigenous cereal nor an indigenous ruminant quadruped, nor clay suitable for pottery. Under more favorable circumstances, its inhabitants would probably have achieved greater results.

CHAPTER IV.

THE BRONZE ERA.

Section 20. *Bronze Age Industry.*—In most of the continents, the edge tool of bronze superseded that of stone and was used for many centuries as the most important product of industrial skill. Native lumps of copper, gold and silver were found in many countries but were too soft to be serviceable for cutting wood, and therefore had little value except for ornament. Meteoric iron was also found, but the savage had no use for it because he could not reduce it to desirable sizes and shapes.

As copper is distinguished for the abundance and large size of its lumps of native metal found in all the continents, so tin is remarkable for the facility with which it can be separated from its ore. Its melting degree is 451, which is wonderfully low as compared with 620 for lead, 1870 for silver, and 2000 for gold and copper,—the only other metals known to the peoples of the Bronze Era. Tin ore can be and doubtless was reduced first in an open wood fire and thus was presumably the first of the smelted metals, the one that suggested efforts to smelt other ores which at-

tracted attention by their high specific gravity and their lustrous appearance.

Bronze is so different in many of its qualities from each of its constituent metals, that they were certainly not mixed for the first time with the expectation of producing an alloy varying in its qualities according to the proportions of its component parts. Perhaps it was first made by smelting an ore which contains both the metals (Humboldt says such an ore is found in Cornwall) or it may have been produced as a fraudulent adulteration of copper when that was the dearer metal, and was valued only for the material of ornaments.

Copper cannot be smelted without a furnace. Wood could not furnish the necessary heat, nor could charcoal until its combustion was stimulated by a draft. Neither the coal nor the furnace was needed by the savage for any purpose except metallurgical work, and the questions about the methods, in which he discovered the one and invented the other, and then found out their value to him, are interesting.

It is probable that he became acquainted with both in the course of cookery. He often baked his food in pits which he filled with wood, burned it to coals; threw in his meat, his tubers, his acorns, and his grain, and covered the food with a layer of leaves, then with one of red-hot boulders, and finally with earth. When he opened his pit

after six, twelve or twenty-four hours, he found, besides his cooked food, perhaps some charcoal which could be used for fuel on another occasion, and would make more heat than wood. Occasionally he dug his pit into a bank and made a lateral opening which gave a draft, and the intense heat, when he burned charcoal, fused lumps of ore which he intended to use as red-hot stones in his cooking. Thus he learned how to make a furnace, to smelt copper, and to begin his career as a worker in metals.

For a very long period before 1000 B. C. bronze was the most important of the metals in all the continents of the Old World; and in North and South America for some centuries before the time of Columbus. The nations about which we know most, while this alloy was the symbol of their culture, are the Egyptians, Aztecs and Quichuans, who were much superior to the Polynesians in polity, sociality and religion, as well as in industry.

Tin ore is found in but few countries, and as compared with the steel of our time, bronze was always a rare and dear metal. It was not made into large axes, adzes, pickaxes, mattocks, crow-bars, sledge-hammers, anvils, or heavy spades, shovels and hoes, but was shaped into very light tools, which, to the modern worker, appear to be wholly inefficient. Much of it was also applied to the ornamentation of the person, the palace and

the temple. Silver and gold were obtained from veinstone by smelting, and were used for money in small bars, and in many forms for decoration.

The art of making mortar was discovered by the Egyptians and Aztecs and perhaps by the Quichuans. It, too, was an accidental product of the cooking pit. Some of the stones which were heated red-hot contained lime; when thrown into water they crumbled to pieces, and when the fragments were thrown out on the sand and mixed with it, the combination hardened into a stone-like substance. Out of this discovery grew solid masonry, the stone-cutting chisel, the square, the plumb-line, the measuring rule, the strong fortification, the well-built and durable city.

The Aztecs and Quichuans, as well as the early Egyptians showed much architectural enterprise and distinguished themselves by the magnitude and durability of their ecclesiastical buildings. The large size of many of their stones implies that they had masonry at first without mortar, and that for a time they trusted for the stability of their walls to the weight of their blocks until they learned how to bind them together. All the pyramids, obelisks and greater temples of Egypt date from the Era of Bronze, and are marked by grand design, and wonderfully accurate stone cutting.

The Bronze Era made many improvements in agriculture. In this period we first meet, in domestication, wheat, barley, rye, oats, rice, doora,

potato, tomato, cacao, vanilla, cayenne pepper, onion, garlic, cotton, flax, hemp, apple, pear, olive, vine, cow, sheep, goat, ass, llama, goose, duck, turkey, hen and pigeon. As the early Egyptians had many fruit trees and vines, it is probable, but not certain, that they understood pruning, grafting, and budding. They and the Aztecs and Quichuans had extensive irrigation canals with which they watered their fields assiduously. In pasturage, the Aztecs and Quichuans were far inferior to the early Egyptians; the Aztecs had no herds of ruminant animals; the Quichuans had only one tame ruminant, the llama, and did not discover that it could supply them with milk, which would have enabled the wife to reduce the suckling period of her children from three to two years, and would have enabled her to rear more children besides giving her more time and strength for keeping her home in order. There is no proof in history that pasturage appeared anywhere before tillage.

Sec. 21. *Egyptian Polity*.—Despotic monarchy, hereditary nobility and the bondage of the multitude were prominent features of polity in the Bronze Era. The Egyptian people were divided into permanent classes of nobles, commoners and serfs, separated by prohibitions of intermarriage and by other bounds that were rarely crossed. The multitude were attached to the soil; the commoners, a much smaller class, were soldiers and free peasants; and fewer still were those who held

the military, political, judicial, and ecclesiastical offices. Public records were kept and the business of the government was conducted in accordance with long-established customs. The possession of cities surrounded by solid walls of masonry contributed, with the peculiar isolation of the country, to give permanence to the political institutions of the country, which seem to have undergone very little change in thousands of years.

The polity, sociality and religion of the Aztecs and Quichuans, though in many respects original and very interesting, will be passed without explanation in this book, because they have exerted no perceptible influence on the general course of culture, which is the subject of the present study.

Sec. 22. *Egyptian Sociality.*—Morality had a permanent place in the social life of early Egypt and was enforced by promises of abundant reward and by threats of fearful punishment in a future life. The priests asserted that after death every soul was solemnly tried before a court composed of several national gods, in the presence of forty-two district gods, each having special guardianship of one of the cardinal virtues with knowledge of all its violations. In this court the soul was tried with the certainty of condemnation in case of guilt; and not until the district gods had affirmed the claim of innocence was the soul permitted to pass on to the abode of the blest. No other ecclesiastical system had a superior ethical code, or

attached more importance to morals as compared with ceremonial observances, or presented the obligations of correct conduct to its believers in more impressive forms. The Egyptian sinner could not get into heaven by bribing the priest.

The hieroglyphical system of Egypt seems to have originated in the Nile Valley and to have been developed there through all its stages. Its first form was a picture meaning nothing but the thing drawn; as a gazelle to signify a gazelle. The next step was a figurative picture in which a gazelle might mean speed. The third was a conventional drawing in which a man with a peculiar dress meant a god. The fourth was a combination of figures in which a house and a god meant a temple. The fifth was a suggestive sign in which waving lines indicated water. The sixth was the cursive hieroglyph in which the drawing of an object was represented by a scrawl. The seventh was the sign not of the thing but of a syllable in its name. The eighth was the suggestion of a sound or letter in the name of the thing. All these steps are traceable in the writings of the Egyptians to whom we are indebted for the beginnings of our alphabet. They however after inventing letters did not restrict themselves to them, but continued to mix them with word signs and syllabic signs, and instead of limiting themselves to one sign for a letter they used as many as five or ten; so that their records are highly con-

fused, and it was left for the Phoenicians to produce a simple alphabet which was copied by the Greeks, from whom, directly or indirectly, modern Europe learned the art of writing.

The ancient Egyptians had an abundant literature, the remains of which, including duplicates, contain as many words as there are in a thousand copies of the New Testament. Some of these books are political and ecclesiastical records. In astronomy and geology the ancient Egyptians knew enough to fix accurately the siderial year and the position of the meridian, and to retrace the field boundaries obliterated by the annual flood of the Nile.

Sec. 23. *Egyptian Religion*.—To the religious ideas and equipments of the Third Era, the Fourth added a temple of solid masonry, a written revelation, more elaborate forms of worship, numerous and well-carved idols of stone and metal, a greater differentiation of occupations and jurisdictions among the divinities, and the inventions of an eternal future life, a heaven, a hell, and a method of salvation, the last to be sold as a kind of sacerdotal merchandize.

The most prominent feature in the ecclesiastical system of ancient Egypt was ancestor worship. Man's highest duties were to see that his father's body was embalmed in the most durable manner, buried with the highest honors, preserved with the greatest care in a costly tomb, and honored at

certain festivals every year with prayers, hymns and offerings of food, drink and flowers. The mummy was regarded as the preferred residence of the departed soul, but not unfrequently a stone statue of the deceased person was also placed in the tomb, to serve as a home for the spirit, in case that the mummy should not be satisfactory.

The serfs and the poorer commoners had no ancestral divinities, and they paid their most zealous worship to their district god, who in one place was a bull, in another a cow, in another a lion, in another a cat, in another a hawk, in another an ibis, in another a crocodile, and so on through forty-two districts. The chief city of each district had a temple in which one of the sacred animals, if obtainable, was always kept, and was pampered to the highest degree while it lived, and mourned over most extravagantly and embalmed when it died. This local divinity, in all its forms, was sacred to all the people of its district, though the Egyptians in other districts did not hesitate to kill and eat it and do their utmost for its extermination.

Besides worshiping their ancestors, the sovereign and the nobles adored the great national divinities, including Ra the Sun, and others, most of whom seem to have been sublimated forms of the gods of the large and wealthy districts. A common custom required the priest of a district temple to address his prayers to three gods, of

which the first was the divinity of the district and the others were the gods of neighboring districts.

The priests made morality a religious duty, and inserted in their sacred scriptures many excellent ethical maxims, compliance with which they declared to be indispensable as a condition of securing happiness in the future life. Mere morality however was not enough for salvation; the spirit of the dead man could not escape from hell unless it should follow the ceremonial directions of the priests who placed a written set of instructions in the wrappings of the mummy to guide the soul in pleading its case at the last judgment before Osiris.

Sec. 24. *Brahminism*.—The religions of the Aztecs, Quichuans, and early Egyptians and Chaldeans have died, but Brahminism, the ecclesiastical system adopted by the Hindoos while they were in the Bronze Era still lives and is an excellent representative of the oppressive character of the institutions of that period. It has many sacred books, notable among which that of Menu or Manu, containing rules of political, civil, criminal, and moral law, is the manual of the Brahmins. Its most prominent feature is the system of caste by which the people are divided into five hereditary classes,—priests, soldiers, farmers, servants, and outcasts,—who are separated by boundaries which can never be crossed except by degradation to the lowest rank. Be-

tween persons of different castes there can be neither legal marriage nor reputable social intimacy.

The priest is high above every other man in dignity and power, the peculiar favorite of heaven, the only mediator between divinity and humanity, the sole director of the rites that must be performed at birth, marriage and death; the exclusive custodian and interpreter of the sacred books; the authoritative teacher of all learning; the proper judge in all civil and criminal trials; the only qualified legislator; and the most suitable person to be the prime minister of every national administration.

According to some Brahminical teachers, one all-pervading divine spirit, Brahm, fills the universe, and is the source from which every human soul emanates and to which it finally returns, usually after transmigrating through the forms of many brutes. The universal spirit may be conceived in different attributes such as those of creator, preserver, and destroyer, and may properly be worshiped under many names and forms, with hymns, prayers, offerings of food and flowers, and, on rare occasions, with sacrifices of brutes.

The ceremonies prescribed for the priest, the warrior and the farmer,—these are the twice-born or regenerate people, while the other castes are beyond the gracious favor of heaven,—are so numerous and so complicated that only those persons

who have studied them for many years can perform them properly, and therefore the assistance of a priest is always necessary; and for his services, large fees are due, to the great profit of the sacerdotal class.

Although carefully devised for the purpose of subjecting the other classes to the priests, Brahminism has a serious defect in the lack of completeness in discipline. It has no hierarchical organization, no central authority to which all its priests are subject. Instead of being divided into different ranks, each under its controlling officers, and these again directly or indirectly under the guidance of a supreme pontiff, the Brahmin priests are equal to one another and each is independent. This ecclesiastical system is anarchical in character, and it suggests at least the probability that when the Book of Menu was composed, the Hindus were divided into many states, the governments of which would not have allowed their priests to combine under one supreme sacerdotal chief.

The Brahmin has a decalogue,—probably the oldest of decalogues,—in the book of Menu, which commands veracity, the return of good for evil, control of gross sensual appetites, evenness of temper under provocation, fortitude in adversity, and abstinence from illicit gain, but on the other hand exalts ceremony above morality, consecrates class privilege, commands despotic government,

condemns the great majority to cruel oppression, and while pretending much zeal for right in small matters, gives its sanction to some of the greatest wrongs under which mankind has ever suffered. Its power has been a great and perhaps the chief obstacle to industrial and political progress in Hindostan.

Besides the book of Menu, the Brahmins have many other sacred books; and among these the Rig Veda, a collection of very early hymns, is accounted most authoritative, but more influential were and are the great epic poems, the Mahabharata and the Ramayana, which give accounts of the doings of the gods on earth in impressive verse which is read by professional elocutionists to the multitude and listened to by the ignorant with absorbing interest and unquestioning credulity.

Sec. 25. *Bronze Era Review.*—The production of bronze was the most important fact of the Fourth Era. By enabling men to make tools of a hard and elastic metal, it led to many improvements in the useful arts, a further development of tillage, the acquisition of herds of ruminant animals, a large differentiation of occupations, and the construction of temples, palaces and fortifications of solid masonry. The accumulation of wealth and the increased security of life and property gave more permanence and elaboration to political institutions, led to the invention of hieroglyphics and letters, and to the origination of new ecclesi-

astical ideas. Here, Industry was evidently the most potent factor in the advance of culture; Polity came next to it in influence, and social and religious changes were the accompaniments or consequences, rather than the causes, of progress.

CHAPTER V.

THE GREEK-ROMAN ERA.

Section 26. *Greek-Roman Industry.*—We have now reached the Greek-Roman period, which began about 1000 B. C. and continued until 300 A. D. and was the first part of the Age of Steel, which metal superseded bronze as the preferable material for tools and weapons. In this period, for the first time, we reach the domain of authentic history; for although we have inscriptions and written documents, we have nothing that deserves to be called history of an earlier date.

The weapons, tools and ornaments of the Bronze Age, collected and exhibited in modern museums, number scores of thousands and are a considerable part of a stock produced in many centuries, yet most of them are small and their aggregate weight does not exceed a few tons, indicating that their material was rare and precious, perhaps relatively a hundred-fold more valuable than the same weight of steel now-a-days. Among all the ancient bronze tools now in existence there is not one large axe, adze, pick, mattock, hatchet, hammer, crowbar, or spade like those of our time.

The celt, the best implement of the Bronze Age for cutting down trees, weighs perhaps one tenth as much as an American axe-head, and was made to be fastened by tying to a short, small handle, fit for use with only one hand. The efficiency of a tool for tree chopping depends on its having a strong handle long enough for both hands, a weight as heavy as a man can steadily swing and a fastening of the handle to the head that will not be disturbed by many hard blows. In these points the bronze celt was extremely deficient. It was a chipping rather than a chopping tool.

When men had learned how to make steel and had obtained it in considerable quantity, it superseded bronze not only because it can be smelted with less labor and less skill and its ores are more abundant and more widely distributed, but also because it is harder, more elastic, more varied in its different combinations of hardness with elasticity, more easily convertible from hardness to softness and from softness to hardness, more susceptible to a wide range of tempering, and more easily shapeable. The heats, at which it becomes soft and at which it fuses, are separated by more than a thousand degrees and, because of this wide range, it is the most forgeable of all substances. Nearly all other metals melt as soon as they become red-hot, and at a temperature very little higher than that at which they are softened; and for this reason the furnace is of no practical use in

preparing them for the hammer. Forging is a simpler and cheaper process than casting, and that fact contributed much to the substitution of steel for bronze as the material for edge tools. After steel came into extensive use, its production became an approximate measure of national wealth, power and intelligence. Those states, which produced most of it, had the best and most abundant tools and weapons, the highest agricultural and mechanical skill, the most numerous and strongest fortifications, and the most thorough military drill. In short they became the leading nations.

Among the industrial improvements that made their appearance and came into extensive use in the Greek-Roman Era were the arts of attaching a mold-board to the primitive plow, coining money, cutting stone with sand-saws, grinding grain by water power, and making suction pumps, valve bellows, and military engines for throwing large stones and wooden bolts against fortifications. Shipbuilding and navigation also advanced. A regular maritime commerce arose between Mediterranean ports and the British islands and between the Red Sea and Hindostan, taking advantage, in the Indian Ocean, of the monsoons which blow from the West during one-half of the year and from the East in the other half. Grafting, budding and pruning became extensively known and perhaps had their origin in this period.

Coined money, which greatly facilitated the exchange of the products of labor and stimulated industry, made its first appearance in Asia Minor in the VIIth century B. C., and was soon after copied in all the countries bordering on the Mediterranean, and also in Chaldea, Hindostan and China. Little bars of gold, silver, bronze and copper had been used previously in commercial business, but their use was obstructed by the trouble of weighing them and the rarity and inaccuracy of the scales. The stamp of a city or monarch in good standing was a guaranty of weight and credit, even though the coin was irregular in shape, not accurately round as now, and though the die was rude, and the impression made under a hammer.

The primitive plow, used by the early Egyptians, was similar in construction to the modern shovel plow (which throws half of the earth from the furrow to one side and half to the other), and renders good service in loose mold; but is inefficient in a hard soil or strong sod. The plow, as improved by the Romans, has a horizontal share which slices off the surface of the field, and a moldboard which throws this slice off on one side and turns it over, thus not only killing the vegetation in the sod, but exposing a lower layer of the earth to the atmosphere, and doing its work with an evenness and an ease previously impossible. The productiveness of agricultural labor was dou-

bled by the attachment of the share and mold-board to the plow.

The earliest extensive system of graded and well-paved roads was made by the Romans, mainly for military purposes, through all the provinces of their great empire. They laid a foundation of broken stone, and covered it with cut blocks, usually a foot or more in diameter. Water was carried off by drains at the sides; swamps were crossed on embankments, and high hills were tunneled. Houses at intervals provided food and shelter for travelers and for persons who were to assist in transmitting official dispatches or to wait on government messengers. The surface blocks generally are so large and smooth that horses could not trot or run over them with safety, and that oxen would have to walk slowly to avoid the risk of slipping and falling. Such paving was designed mainly for the use of footmen. The streets of Pompeii show no such ruts as we see in the stone pavements of many modern cities and its high and wide stepping stones which were evidently designed to enable pedestrians to keep out of deep mud in the middle of the street would have been great obstructions to wagons drawn by horses. We know that much of the freight of the Roman armies was carried by slaves, for whom the pavements were excellent.

Besides being the first people to make long, hard and smooth roads, the Romans were also the first

to erect large arches, domes, bridges, aqueducts, and amphitheatres of solid masonry, to use burned brick extensively in architecture, to lay harbor walls in hydraulic cement, to erect stone and brick dwellings of many stories and to heat the dwellings of the rich with hot air from basement furnaces.

Sec. 27. *The Greek State.*—The Greeks transferred the leadership of culture from Western Asia to Europe. With just pride they regarded themselves as superior in education, morality and government to all the other nationalities known to them. The name of *barbaroi*, which they gave to the people of other tongues, suggested to them not only unintelligible speech but also despotic government, low morality and coarse manners, as “barbarian” does to the citizens of enlightened countries in our own time.

About 600 B. C. the typical Greek state was a walled city with a territory not more than thirty miles square. The government was an aristocracy which included not more than one-fourth of the adult males and not more than one-half of the adult male freemen. At least half of the people were slaves; and at least half of the freemen were excluded from any share in the government. The nobles were the owners of nearly all the land and the only professional soldiers. Every man of them had his spear, sword and defensive armor. His occupations were to govern the state, defend it in

arms and direct his slaves. He despised manual labor of all kinds, but in his military drill and service he received severe muscular training and was a hard worker.

Sec. 28. *Sparta*.—Among the Greek aristocracies the most durable and one of the most remarkable known to history was that of Lacedaemon, which had a territory equal in area to a district forty-five miles square. Its political system, established about 800 B. C. gave all the political power to the Spartans, the heads of nine thousand noble families, each of which had an estate of perhaps a hundred and fifty acres, with two or three commoner families as tenants and twice as many serfs. These noble estates guarded by primogeniture and entail, so that they could not be divided among children nor taken by creditors, were intended to secure the perpetuity of the Spartan nobility and government.

The constitution was framed for the purpose of developing the highest military efficiency of the ruling class. From the age of seven till forty-five the Spartan was subjected to a severe daily drill. He was told that he must never surrender nor run away in battle, nor break ranks to chase a defeated enemy. These lessons were taught so impressively that never once in five centuries full of warfare were they grossly violated. Such uniform fidelity to military precept, such fortitude in meeting death, and such social scorn for cowardice

never prevailed in any other community. The Spartans were often overcome by superior numbers or superior generalship, but never defeated disgracefully; and three of their famous defeats,—those of Thermopylae, Sphacteria and Corinth, are more glorious as displays of military discipline, than the most splendid victories of any other nation. At Thermopylae, three hundred Spartans devoted themselves to certain death to convince the Persians that the conquest of Lacedaemon, if possible, would be highly unprofitable; and one man of the three hundred, Aristodemus, having been absent from the field of battle under circumstances not satisfactory to his countrymen, escaped from further disgrace by seeking and finding death in the next battle of Plataea. At Sphacteria, one hundred and twenty Spartans, when surrounded by ten times their number of Athenians and when they had no hope of escape beat off their foes for days with much loss to themselves and refused to surrender until ordered to do so by a special message from the head of their government. This was the only case on record in which so many as one hundred Spartans in a body became prisoners of war. In a battle near Corinth, a detachment of six hundred Spartans was surrounded in a plain by a much larger Athenian force, including slingers and archers who slew their enemies from a distance and ran when approached. After more than half their number had fallen, and

when there was no apparent hope for them, the survivors refused to surrender intending to die on the field, but, fortunately for them, news of the battle reached a body of Spartan cavalry which rushed to the rescue and arrived in time to save two hundred out of the six hundred. Each of these defeats is more creditable to the soldiers who suffered it than any victory has ever been. Greater generals, larger armies, more successful battles and more extensive conquests may be found in the history of Macedon, Rome or France, but those countries never had one regiment that knew so well how to die as did every regiment of Sparta. Admirable as soldiers, these men were generally coarse, insolent, tyrannical, corrupt and merciless to those who became subject to their power. They reached eminence in nothing save polity and military drill.

In her wars, Sparta lost about twenty of her nobles (beyond the natural increase) in the average year; and as her constitution did not provide for promoting commoners to fill the vacancies thus left, her ruling class was reduced in four centuries from 9000 to 1000 men, which latter number was not sufficient to maintain a warlike nation without wealth to pay mercenaries. We can say of Sparta more truly than of any other state that it died by bleeding to death.

Sec. 29. *Athens*.—About 600 B. C., the intellectual leadership of the Greeks, previously in the

Hellenic cities of Asia Minor or Southern Italy, was acquired by Athens which, as a state, had an area equal to a tract thirty-five miles square, and a population of not more than 500,000, of whom three-fourths were slaves. Her government advanced without violent revolution, from monarchy through aristocracy, to democracy, and became the most famous and brilliant of all city states. She holds a typical place in the history of political and civil freedom.

The conditions of the VIth century B. C. made an opportunity for the rise of some city in Greece to the position of the commercial metropolis of the Mediterranean. Tyre had outlived her highest prosperity, had been oppressed by Persian despotism, and had been left behind by the westward movement of culture. Her successor must be in Greece because that country had a central situation, and liberal governments, and the great advantage of community of speech and sympathy with the numerous Hellenic seaports on the shores of Asia Minor, the Aegean Islands, the Black Sea, Sicily, and Southern Italy. Such was the opportunity which Athens seized and then developed with the most brilliant success.

She had begun her career as a state with hereditary monarchy, her king being also her chief priest. In 1082 B. C.,—the date is traditional and not very trustworthy,—an aristocracy was established, the governing power being exercised by a

hereditary council (the Areopagus) with an elective executive head (the archon) holding office for life, and invariably chosen from the descendants of the ancient royal family. In 752 B. C., the life archonship was changed to an archonship for ten years; forty years later the office was thrown open to all nobles; and in 683 B. C. its functions were divided up among ten archons, all of whom held office for one year only, and after the close of their official terms became members of the Areopagus, which absorbed all the high administrative experience of the state, and obtained complete direction of the government.

Another revolutionary change was made in 621 B. C., when under the leadership of Draco, the Areopagus revised the list of those eligible to the office of archon, struck off many poor men of noble blood and inserted the names of commoners who had acquired wealth. The disfranchised men resisted by force, and extensive dissatisfaction, continuing for thirty years, led to the adoption of a decree authorizing Solon to prepare a new constitution, the terms of his commission being so framed that he might assume despotic power, as his friends hoped he would. At that time despots were numerous in Greece, and some of them were efficient and politic rulers.

Solon however would not imitate their example. He transferred the supreme legislative power from the Areopagus to the assembly of all the

freemen, and established popular courts in which important lawsuits, civil and criminal, were decided by large juries. By abolishing enslavement for debt and enacting a simple method of naturalizing aliens, who were numerous in the city, he strengthened the democratic influence. He laid the foundation for a strong navy and taught the Athenians to develop and protect their commerce.

His popular assembly did not work. The commoners were not sufficiently educated in the art of government to manage it successfully; the nobles generally were hostile to it; and a cunning usurper, Peisistratus, took advantage of the discord to become master of the state, and he and his son, Hippias, held the power for nearly half a century. The latter was driven out in 510 B. C., and then two factions of nobles contended with each other for fifteen years to obtain control of the government. One of these factions under Cleisthenes "took the rabble into partnership" as Herodotus said, and with their help carried a number of constitutional amendments, to exclude nobles and despots from dominating influence in the state.

Instead of meeting only once a year to confirm the acts of the Areopagus, as had been the custom under Peisistratus, the popular assembly was required to meet once a month, and to dispatch business prepared for it by a large committee, the Council of Four Hundred, with the assistance of boards chosen by the people to take charge of dif-

ferent branches of the administration. The assembly was guarded by judicious rules which gave interest to its meetings and efficiency to its action. No business proposition could be considered until presented by the Council; no speaker could be heard until invited to the stand by the President.

The amendments of Cleisthenes had been drawn with much judgment, and the assembly soon became the true ruler of the state. Its meetings were well attended, orderly and swift in despatching business; its decrees were wise and dignified; it commanded the attendance, developed the talents, and rewarded the genius of the most remarkable series of orators that the world has ever seen. During the sixty years of its highest prosperity, from 490 to 430, it always had a great statesman at the head of the government; and the four most noted leaders of this period,—Themistocles, Aristides, Cimon and Pericles,—were the four greatest statesmen that were ever contemporaries in any one state.

The amended constitution had scarcely got into working order when in 490 Athens was subjected to a most severe trial by an invasion of 100,000 Persians, to whom she could oppose only 11,000 soldiers; but with these she attacked and crushed the Asiatics at Marathon. Ten years later the Persians returned and again were overwhelmed by the allied Greeks under Athenian leadership at Salamis, Plataea and Mycale. During half a cen-

tury Athens enjoyed a prosperity and power without example in the world, but she provoked the envy of other Greek states which combined against her, conquered her, impoverished her, and what was worst of all, killed off in war most of her citizens of ancient Attic blood, and left her under the control of an inferior class of people, who never rose to the level of the assembly in the age of Pericles.

The ornamental art, literature, and statesmanship of Athens were the most brilliant the world has ever seen. Within one century, and with only 400,000 inhabitants, she attained a higher aggregate of excellence in architecture, sculpture, dramatic poetry, history, oratory, and philosophy than any modern nation with ten or twenty fold as many people in three or four centuries. The production, by a country so small as Attica, within three generations of Themistocles, Aristides, Pericles, Cimon, Thucydides, Aeschylus, Sophocles, Euripides, Aristophanes, Phidias, Ictinus, and Socrates, is a fact unparalleled in history, and has never been accounted for satisfactorily.

Sec. 30. *Macedon.*—More than a century and a half after Athens had been conquered by Sparta, the Macedonians, a people near akin in blood and speech to the Greeks, though by the latter called "Barbarians," conquered Persia and established separate kingdoms under Greek-Macedonian dynasties in Egypt, Syria and Chaldea. The monarchs

of these states introduced Greek ideas, the Greek language and Greek political methods into all their cities; and made Greek the medium of learning for all their subjects.

Before they began to fall before the power of Macedon, the Greek states numbered more than three hundred, most of them in Asia Minor, Southern Italy and Sicily, several on the shores of the Black Sea, one (Cyrene) in Africa and one (Marseilles) in France. About 450 B. C. perhaps one in twenty of them was ruled by a despot,—usually a liberal despot,—and the remainder may have been nearly equally divided between aristocracies and democracies. In most of these cities there was a large discontented class; of commoners in the aristocracies, of nobles in the democracies, and of both in the despotisms. Revolutions from one form to another were frequent and sometimes merciless in the slaughter or banishment of the active members of the defeated party and the confiscation of their property. Such disturbances were fostered by foreign influence because each class of governments made a habit of assisting those of its kind. Athens was regarded as the friend, and Sparta as the enemy of all the democracies.

The Hellenic states which produced the most brilliant statesmen and generals were ruled by democracies or liberal oligarchies, in which the dominant party of nobles extended the franchise to many commoners, and thus obtained the assist-

ance of the merchants and other men of much business experience in the management of public affairs. The state might be durable with a relatively small number of citizens possessing an equal share of political power, but it was not conducted with signal ability.

The science of government reached a much higher development among the Greeks than in any earlier or contemporaneous nationality before the rise of Rome, especially in the department of constitutional law. Their extensive maritime commerce and their habit of meeting frequently in large numbers at the Delphic Oracle and at the Olympic and other athletic games assisted the formation of a widespread public opinion which strongly resented any serious and extensive trespass on the rights of freemen, an opinion which despots generally respected and sought to conciliate. This public opinion and the consequent respect of most of the governments for the dignity of humanity were the chief bases of the intense pride which the Greeks felt in their Hellenic blood.

For several centuries before the time of Alexander, Greece was so populous that it imported much of its food. Its naval preponderance gave it the control of most of the maritime traffic of the Mediterranean; and its constitutional governments gave to its citizens and aliens better protection for life and property than could be found elsewhere; while its educational institutions, pub-

lic entertainments and social liberality made it attractive to aliens. People and money accumulated in the cities. But all these advantages disappeared soon after the Macedonians became masters in Egypt and Western Asia; and then most of the Hellenic states declined rapidly in population and wealth.

Sec. 31. *The Roman Republic*.—Rome was enabled or assisted to supersede Greece as the center of culture by its combination of a superior government with military and commercial advantages. The increasing development of the western shores of the Mediterranean gave a central position to Italy, and Rome was near the middle of that peninsula. It is situated on the largest river west of the Apennines, at the head of navigation, where hills abutting on the stream and an island offered good sites for fortifications. This position was occupied by an aristocratic state, which had an excellent army, great ability in its dominant senate, and a political system that permitted the admission of conquered subjects into equal citizenship. This was the first constitutional government that provided for the extensive naturalization of aliens, and also the first one that achieved a great enlargement of its territory.

The Greeks thought that a state should have a territory not more than thirty miles square, and that its citizenship should not be granted to persons of alien birth unless they made their homes

in or very near the capital city; and under such rules, Athens at the summit of her power had not more than 30,000 citizens. It was the ambition of Rome to have as large an area and as many citizens as possible; and therefore in the early period of her growth she had ten times as many citizens as Athens ever had; and the multitude of her citizens subjected to high military discipline, enabled her to conquer all the states between the Tigris and the Atlantic, to swallow them up in her empire and to make their freemen proud of the name of Roman citizens.

The official title of the state under the republic was "The Senate and People of Rome." At first the term "People" included only the nobles, excluding the senate and the commoners. The last had no vote and could not hold office, nor serve in the army among the heavy armed troops. Their military services however soon became indispensable and then they could no longer be deprived of political rights, which were given to them in numerous concessions granted at intervals extending through several centuries. They were permitted to vote, then to hold the tribunitian office, afterwards the consulship, then the praetorship, later the censorship, and finally the high sacerdotal offices. Each of these concessions was a constitutional amendment, and when the person of plebeian blood was to become Pontifex Maximus of the republic, the reign of political equality for

all the freemen seemed to be at hand; but it never came in Rome. The concessions were incomplete; though made by law they were defeated by custom. The poor could not be elected to office because of their inability to give the popular entertainments demanded from candidates; and though they had a great preponderance in numbers, could not control elections, because these were decided by a majority not of individual votes, but of voting groups which last were arranged unequally so that the rich should have their way.

During the last century and a half before the establishment of the empire, the government though nominally a republic was really an oligarchy, or rather a plutocracy, of about two thousand rich men, ruling most arbitrarily and corruptly over an ignorant, violent and idle populace in the capital and plundering all the provinces by the most cruel and ruinous system of extortion. The popular amusements were coarse and debasing; mostly gladiatorial shows and horse-racing, with nothing like the inspiring tragedies, or the intellectual and athletic contests of Greece. Rome's ablest oratory was addressed to the Senate or the Law Court, not to the mass meeting of the people. The simplicity of life observed by the Athenian statesman, was not imitated in the Italian metropolis; there the high official was always accompanied, when he went into the street, by a crowd of sycophants, who by their servility

advertized the moral, political and pecuniary degradation of the multitude in their city.

This century and a half of republican imperialism was disturbed by numerous and great internal convulsions,—including the Samnite rebellion, several slave wars, and civil wars between opposing parties in the capital,—leading to much more bloodshed and desolation than those of the Carthaginian wars, and to the conversions of hundreds of thousands of small rural estates tilled by independent farmers into immense ranches occupied by slaves. Many of the freemen, driven from their ancestral homes, sought refuge in the metropolis where they were some of the 300,000 who received free bread every day from the public bakehouses.

The chief credit for the power and permanence of the Roman republic must be given to the judicious organization of the Senate. That body consisted of three hundred members holding places for life under an appointment which was given as a rule only to the men who had held the consular office with credit. The consul was elected by the people after he had served as an officer in ten or more campaigns, commanding the men who controlled the elections. Under this system the Senate counted among its members all the citizens who had extensive experience in the highest military and political office. They were fighters not talkers, and before they had been demoralized by the plunder of Africa, Syria, Sicily and Asia Minor, they governed the state with great wisdom.

In the earlier centuries of Rome, her arms, her industry, her education, her ecclesiastical system and her social organization did not differ much from those of adjacent states and therefore could not have been the causes of her triumph over them. Her military discipline may have been stricter, but on that point we have no precise information; about 200 B. C. she certainly had the best military equipment and the largest citizen army of antiquity; but this army and its equipment were the outgrowths of the political constitution. The wisdom of the Senate, the policy of extending the citizenship and the power of the army were the three main factors in the growth of Rome; but the last two may be accounted effects of the first, the wisdom of the Senate.

Sec. 32. *The Roman Empire*.—After an existence of four centuries and a half, in 44 B. C. the republic was overthrown, when it held dominion over 100,000,000 people. During all that time it produced no great epic or tragic poet, no great sculptor or architect, no great scientist or philosopher. The century after the overthrow of Hannibal gave no such literary luster to Rome as was given to Athens by the century after the defeat of Xerxes.

Having become intolerably corrupt in all the branches of its administration, the republic was overthrown by Julius Caesar who established the empire which his successor, Augustus Caesar, consolidated: giving to the whole empire, from the

Atlantic to the Euphrates, peace, security, rights equal or nearly equal and a general prosperity such as no extensive region in Europe or western Asia had ever before enjoyed. The defects of the provincial administration under senatorial rule were corrected. The governors were appointed for three years with adequate salaries and were held responsible for abuse of authority. Justice was administered impartially. The civil and criminal law was developed in admirable completeness. The rights of person and property were defined and protected. Every city became an independent republic in the administration of its local affairs. Accumulations of land in great estates and of a great number of slaves were discouraged, and the horrors of slavery were diminished by humane provisions.

Many provinces enjoyed more prosperity and security than they ever had either before or since. All the useful arts advanced. Cities multiplied, wealth accumulated, education increased. The people were busy in planting civilization in extensive regions which never before had been secure for a single generation from barbarous warfare. The Gallic, the Spanish, the Danubian, the Asiatic and the African portions of the empire gained wonderfully in population, wealth and education. The language of the school, commerce, and public office was Latin west and Greek east of the meridian of the Adriatic; but many men of

learning and authority spoke and wrote both tongues, and the most cordial unity bound together the Latin and Greek provinces. Nowhere was there any large party in favor of breaking loose from the empire; its dominion was everywhere regarded by the majority as a blessing.

As the establishment of the Macedonian empire was disastrous to Greece by overthrowing its social superiorities and industrial monopolies and driving many of its young men to Asia and Egypt, so the organization of the Roman empire, with its better administration of law deprived Italy of the profits derived from the merciless plunder of the provinces, and compelled many of its people to seek their homes in Gaul, Spain, Pannonia, Africa and Asia Minor. These gained rapidly in population, business and wealth, as soon as they saw that the imperial dominion meant continuous order and security for them. The development of the provinces is not described in any ancient book preserved to our time, but it is hinted at in several and we can draw some interesting inferences from recent excavations in the modern French city of Autun, which stands on the ruins of an ancient city laid out presumably in the reign of Augustus, after whom it was named. This ancient city was larger and more elegant in some respects than its successor. Its streets were straight and sixty feet wide, half of them parallel with one another, and the others crossing them at right angles, and

extending from wall to wall. The uniformity of design and the width of the streets implies that the plan was made in anticipation of rapid growth, which really came, for the city filled the whole two and a half square miles inside the walls, with a larger population than there is in the modern city. Such an anticipation and such a growth imply a prosperity similar to that of the western states of the American Union in the XIXth century.

The imperial system had its evils, but they were trifles compared with those which had prevailed under the republic, or before the Romans made extensive conquests. Military struggles for the throne though frequent were brief in duration and were limited to the professional soldiery; and they served to keep up the efficiency of the army and to give the scepter to able men. No other state within three centuries ever had so many monarchs distinguished for high character combined with high capacity.

Conquering warfare filled the market of the republic with alien slaves, who, sold at low prices, were collected on large estates in the provinces, and driven to death so that they should yield the largest profit in the least time. The Senatorial rulers detested these captive enemies and did not protect them against maiming or even murder. But the empire pursued a different policy. It abandoned aggressive warfare, it cut off the sup-

ply of captives, and adopted and enforced laws to protect the slaves. The long imperial peace, with its accompanying social permanence and superior legality, had lightened the character of the bondage. Masters and slaves who had lived together for generation after generation, and had come to be of the same tongue and blood, did not cherish the feelings which had separated their ancestors as victors and vanquished in earlier centuries. The law permitted and public opinion encouraged the conversion of slaves into serfs, thus starting, while the empire was in the height of its security and prosperity, the movement which has since continued towards personal freedom.

Sec. 33. *Roman Law*.—The most valuable and original department of Roman literature is the legal and its excellence is a strong evidence of the beneficence of the imperial government. The codes which took their final shape in the VIth century A. D. comprise a large body of law admirable in every respect, and are among the most remarkable products of human wisdom. Soon after the establishment of the empire the office of praetor or judge became exclusively judicial, instead of being mainly military as it had been previously. Its term was lengthened; its incumbents were selected for legal learning and ability; they were paid by the public treasury and were subjected to systematic supervision in the interest of the state. The profession of the law became hon-

orable and profitable. Law books were written and law schools were founded. Judges published manuals of the general principles of jurisprudence, and teachers of law wrote text books the ideas and phraseology of which entered into the legislation of Rome and of all later enlightened nations. Under the republic law-suits were tried by a brief-term, unpaid judge (who had not studied law) with the aid of a jury. The empire retained the jury, but gave the judge a longer term and a salary and required him to be a lawyer. The separation of the questions of fact from those of law has ever had an excellent influence in jurisprudence and was presumably one of the main causes of the development of the Roman codes.

Sec. 34. *The Greek-Roman Family.*—Greek law recognized only one wife, who was required by custom to spend most of her life in seclusion, devoting herself to her children, her spindle, her loom and the management of her house. She was always subject to the guardianship of a man, usually her father, husband, brother or son, whose agency was necessary to assist her in making a valid purchase or sale of land or slaves. Her husband had the exclusive authority to decide immediately after the birth of her child whether it should live or die. She did not leave the house without a companion nor receive the visits of men unless they were very near relatives, nor sit at the table when her husband had a male guest at din-

ner. Whether she could go to the tragedy in Athens is disputed; she certainly could not go to the comedy or the athletic games, but she might participate in certain ecclesiastical festivals. The Spartan women were exceptionally free; they received public training in gymnastics and were famous throughout Greece for their strength, activity, beauty, courage and patriotic spirit.

Under the Roman law, the man could have only one wife and under the Roman customs her social dignity was much higher than in Greece, or in any African or Asiatic country. Such characters as those of Cornelia, Portia, Arria and Agrippina wife of Germanicus are unknown in those lands where the women are bred in seclusion.

Sec. 35. *Greek-Roman Education.*—In all the Greek cities the sons of the men who had a share in the government were educated in the gymnasium where they took lessons in athletics, reading, grammar, arithmetic, rhetoric and music. After the time of Socrates, Athens had academies where lessons were given in philosophy, dialectics and mathematics. In Sparta, the boy was put into the military camp at the age of seven and subject to severe daily drill. He received lessons in music and probably learned to read, but was not encouraged to become a scholar or an artist.

In all studies except those of medicine and surgery, Athens was the chief center of education

during the VIth, Vth and IVth centuries B. C. Her first highly distinguished teacher was Socrates, who was preëminently a dialectician. He protested against belief without careful examination and clear statement of the evidences and arguments on both sides, and boasted of superiority over other men in not claiming to know more than he knew. Plato, his pupil and successor, adopted the ethical and logical ideas of Socrates and supplemented them with a metaphysical system which discredited the senses by attaching little value to their testimony. He was succeeded by Aristotle, a native of Thrace who devoted his energies to the collection and coördination of facts in botany, zoölogy and political philosophy. A little later than Aristotle was Epicurus who was a teacher of morality. His standard of duty was self-gratification, obtained not by yielding to the impulse of the moment, but to that feeling which would be the source of the greatest amount of pleasure in a long life. His enjoyment was that of the wise man who respects himself and others, the good neighbor, citizen and friend. He gave great prominence to mutuality of obligation and his pupils were distinguished for their fidelity to one another. Because he was a bitter enemy of the sacerdotal trick of scaring people with tales about misery inflicted by divine wrath in a future life, the priests have taken their revenge by habitually misrepresenting his followers as base

debauchees. After Epicurus, Zeno founded the school of the Stoics, accepting generally the Epicurean morality but teaching that the gods take an interest in human life, and that the good man should constantly strive to help them to keep the world straight.

The establishment of the Macedonian dynasty of the Ptolemies in Egypt about 300 B. C. was soon followed by the establishment at Alexandria of the greatest educational institution of antiquity called the Museum, where many able and learned men, including Euclid, Archimedes, Eratosthenes, Apollonius, Hipparchus and Ptolemy (the geographer) were educated and where some of them were assisted to compose and publish their books.

It was in the school of Alexandria that the size of the earth was first calculated with approximate correctness from the length of a degree; that maps were first made with lines representing latitude and longitude; that the first great text books of geometry and geography were published; and that the principle of the lever and the method of ascertaining specific gravity were discovered. Though Alexandria was fertile in great scientists, critics and grammarians, it did not produce one man eminent in tragic or comic poetry, in political, metaphysical or ethical philosophy, in history or oratory, in sculpture or architecture. Thus it presented a remarkable contrast to Athens. These two cities were wonder-

fully fertile in their intellectual labor, but not in the same departments of thought. Some reasons of the differences may be found in the conditions of the two cities. Athens, as a democracy, demanded oratory from its statesmen, and compelled them to study history and political philosophy. Its ecclesiastical festivities made a good market for original tragedies. The sudden and great development of its wealth, pride and intelligence, led to high activity in architecture and sculpture. As the chief center of literature and art, it attracted scholars whose presence led to the establishment of academies, in which the leading subjects of study were grammar, dialectics, oratory and ethical and metaphysical philosophy.

In Alexandria other conditions prevailed. The despotic government there did not encourage oratory, history or political philosophy. The heterogeneous population had no strong sense of nationality and felt no want of new patriotic tragedies. The active intercourse between Hindostan, Asia Minor, Syria, Europe and Northern Africa, made a demand for geographical and astronomical research. Physical science had been stimulated by the comprehensive works of Aristotle, and had been much favored in the constitution of the Museum, which, by means of its large library, its extensive collections of natural objects and of scientific instruments and its liberal endowments of teachers and scholars, gave direction to the learning and thought of its time.

The general tone of Greek thought in social matters was very liberal. The leading men did not consider it advisable to meddle with freedom of opinion or singularity of action, except in rare cases of folly or fury. In Sparta however the noble was restricted in many ways. He was not permitted to devote himself to any mechanical, literary or artistic occupation; he could not travel for pleasure, nor build a luxurious house, nor possess gold or silver coin unless he obtained it as spoil in warfare.

The Greeks regarded themselves as a superior race and would not permit people of other races,—the “barbarians,”—to participate in their Hellenic festivals, such as those of the Olympic, Isthmian, Nemean, and Pythian games. They had good reason to be proud of their superiority in political liberty, military discipline, statesmanship, literature, ornamental art and morality. They had neither the human sacrifices, the cruel mutilations, nor the degrading court ceremonies common in Asiatic countries.

As compared with Athens, which had a smaller population and briefer prosperity, Rome was much less prolific in literature, presumably because of her political confusion under the republic and industrial confusion under the empire when there was a drift of population and wealth from Italy, the home of the Latin language, to the provinces where it was a new importation.

Cicero, Virgil, Horace and Tacitus however are models of excellence in their respective departments, but the most valuable literary productions of Rome were her law books, which are the source of all the enlightened civil law of modern times.

Sec. 36. *Greek Medicine*.—The frequent wars and severe athletic contests produced a multitude of serious wounds and fractures in healing which the Greeks became highly skilful. Before 500 B. C. the medical schools of Cos, Cnidos and Rhodes were famous. Hippocrates, born at Cos in 460 B. C., was the most eminent of the Greek surgeons, and his treatise on surgery is studied with benefit even now. He had risen above the superstition that any form of disease is of supernatural origin, and denied the existence of demoniac possession.

Sec. 37. *Public Games*.—Athletic exercises were considered indispensable for the proper training of the soldier among the Greeks, and every strong, healthy man of the ruling class was required to keep himself in good trim, during his most active years, for military service, by practicing gymnastics in the chief educational institutional of his city,—the gymnasium. Never in any other time or country were so much time and intellectual energy given to such training. Every state had its annual gymnastic games and every year had its panhellenic festival where athletes collected from many Greek cities. The Romans did not imitate the gymnastics of Greece; their favorite public

entertainment was the gladiatorial show in which armed men slaughtered one another. Most of the gladiators were slaves, but many of them fought willingly and found pleasure in practicing their profession. Usually the struggle was between two, one on each side, and thus fifty pairs might contend in an afternoon; but sometimes squads were introduced. Immense sums were spent by consuls and emperors in providing such shows, and the most magnificent of all the buildings of ancient Rome, the Coliseum, with seats for 180,000 persons was built specially for these entertainments. Every large city of Italy and Roman Gaul had its amphitheatre and its gladiators, and their shows were regarded as an excellent school for soldiers who there became familiar with the sight of blood and learned to use their wits to the best advantage in the critical moments of the battle.

The only notable addition to the healing art, while Pagan Rome was mistress of the world, was the discovery of the ligature of the artery in amputations and cuts; but this operation, which has a very important place in modern surgery, did not come into extensive use among the ancients, mainly because the older practice of searing with hot iron or pitch required less knowledge.

Sec. 38. *Greek-Roman Religion*.—Though extremely pious toward their divinities, the Greeks were not priest-ridden in any of their states. They had no sacred book, no sacerdotal hierarchy, no

precise creed and no congregational worship. They originated nothing of importance in theological doctrine or ecclesiastical observances, but with relatively slight modifications accepted the gods, temples, rituals, ceremonies, idols, incense, holy water, chants, prayers, processions, genuflexions, vows and oracles of their ancestors or their neighbors. The chief worship of the early Greeks was paid presumably to their ancestors; but this domestic religion had lost much of its prominence and become relatively rare in many Hellenic communities before the time of Solon; and the guardian gods of the respective cities had become the most prominent objects of devotion. Each had a special temple, and priesthood; and other gods might also have temples in the same city; but there was no sacerdotal hierarchy. The priests of one temple had no subordination to or association with those of another.

Worship was an investment to propitiate a god who though not omnipotent, was extremely powerful, and who if not propitiated might do great harm. Every department of life had its divinity who required that proper honor should be paid to him by every one within his domain. The trader paid his devotion to Hermes, the mariner to Poseidon, the grain-grower to Demeter, the artist to Athena, the soldier to Ares, and so on through a long list. The multitude in the time of Pericles believed not only in the actual existence of these

gods, in their possession of the attributes ascribed to them, and in their frequent and effective intervention in the human affairs of their own time, but also believed that in earlier centuries,—when according to current superstition, faith was livelier and humanity purer,—the deities had taken a much more prominent part in the business of mortals, and had not only founded cities and taught men useful arts, but had become the progenitors of the royal and noble families, from which thousands of people derived their descent, tracing back their ancestry to a god who was not more than twenty generations distant from them.

Although the Pagan Greeks had no book accepted by them as a divine revelation, they had one that held a place similar to that of the *Mahabharata* among the Hindoos. Purporting to be an account of the destruction of Troy, the *Iliad* introduced a list of the early Greek states; gave the names, pedigrees and exploits of their leaders; reported the proceedings of the councils held in heaven about the conflict between the Greeks and Trojans; explained how some gods took one side and some the other; how they plotted and tricked and fought for their favorites; and how each showed his or her characteristics in the warfare. All this is told in the greatest seriousness with matter-of-fact precision in sonorous, harmonious, and eloquent verse, admirably suited for recitation before crowds who could appreciate the orations

of Pericles, the tragedies of Sophocles, and the statues of Phidias.

The unquestioned right of a large proportion of the freemen to perform ecclesiastical ceremonies in their own houses, the belief of many that they were of distinctly traceable divine blood, and the complete independence of each set of temple priests, contributed to give to the Greeks and Romans a peculiar exemption from sacerdotal influence and a peculiar liberality of thought. They were far less subject than the Jews, the Egyptians or the Hindoos to ecclesiasticism and superstition; and it was because of relative exemption from these degrading influences that they were enabled to throw so much energy and intelligence into their industry and polity, to recognize the intellectual and moral dignity of humanity as it had never been recognized by earlier nations, and to carry literature, art, and freedom to heights never before reached.

Though free from superstition as compared with other peoples of their time, they were not free from it absolutely. They were always looking for omens to guide their conduct, and were often governed by them to their loss, as at Syracuse, where a large Athenian army was destroyed because its commander (it was explained afterwards) misinterpreted an eclipse of the moon, supposing it to be a warning against a change of position, whereas he should have known that it was sent to aid him

in moving away from danger under cover of the darkness. Besides omens, the Greeks believed in oracles; and the temple of Apollo at Delphi was the most famous and the most highly accredited oracular authority known to history. Its advice, given in response to queries, was solicited by nearly all the Grecian states and by many Pagan princes in important emergencies, and many of the oracular responses delivered in vague terms were familiarly recited as proofs of the supernatural knowledge and wisdom of the priestesses who delivered them.

Greek priests generally claimed no ethical jurisdiction. They had no decalogue; they gave no moral lessons; they imposed no rules of conduct on those who came to offer sacrifice at the temples. Many of the gods were described by Homer as violent, revengeful, deceitful and lustful, and these descriptions were long received as correct without public protest. The chief teachers of ethics in Greece were poets and philosophers.

The religion of Rome was similar to that of Greece in its recognition of a guardian god of every city, in its list of gods having special professional jurisdictions, in its independent priesthoods, associated with political office, in its vague conception of a future life, in its separation from morality, and in its subordination to the secular spirit. It gave however a much greater prominence to the worship of ancestors, and to the observance of

omens. In Rome, after Cicero, as in Greece after Pericles, most of the educated people had no faith in the gods worshiped by the multitude.

Sec. 39. *Buddhism*.—In the VIth century B. C. Buddhism, one of the most remarkable and successful of ecclesiastical systems, was founded in the basin of the Ganges by Siddhartha, called also Guatama, Sakya Muni, and Buddha. He gave up his place as hereditary prince of a petty state to become an ascetic, a mendicant, and a teacher. Brought up in the faith of Brahminism, he accepted its doctrines that life is an evil, and that sin is punished by the transmigration of the human soul after the death of its body, through brutes and base men, but he rejected conscious immortality, the existence of any divinity superior in power and dignity to the human soul, and also the Brahmin revelation with its caste and priesthood. The chief end of life, according to him, is the attainment of Nirvana,—a future without consciousness,—through the subjugation of every kind of desire, complete resignation to fate, submission without resistance or dissatisfaction to every form of evil, asceticism, poverty, privation, and the highest degree of self-abnegation.

Siddhartha was undoubtedly sincere; he lived in accordance with the rules which he prescribed for others; and he did this when royal luxury was not only within his reach, but after he had enjoyed it in early manhood and when he could not escape

it without a strenuous effort and sacrifice. As a preacher, he made many converts, and his religion has this great advantage over Christianity and Islam, that it owes all its success to its teaching, and nothing to the sword. He divided his followers into two classes, celibates and laymen, giving to each a separate set of commandments and code of morality. The laymen must abstain from intoxication, theft, falsehood, injustice and killing any animated being. The celibates must obey all these rules, and, in addition, must live in the most continent celibacy, eat only once in the day (in the forenoon), eat no food except that obtained by begging, abstain from every kind of labor for gain, own nothing except three coarse garments and a piece of carpet (the latter for bedding), avoid jovial conversation, submit to evil without resistance, and spend much time in solitary contemplation. A society of celibates (male Bikshoos or female Bikshoonies) may own a monastery, but must not build it, nor have any individual property rights in it.

Buddhism was the first of the universal religions in point of time, the only one that never persecuted its enemies, the first to require all its teachers to be ascetics, the first to hold large ecclesiastical councils, and the first to send out missionaries to convert the people of many distant lands. It spread extensively in Hindostan, from which it was subsequently driven out by force;

and also in Ceylon, Nepaul, Thibet, Tartary, Burmah, Siam, China and in Japan. The number of its adherents at present is estimated to be more than 300,000,000, but they accept it in its various corrupt forms, and in all its forms it is suited only to the ignorant and oppressed. It is dying out now before the advance of education and freedom.

Sec. 40. *Judaism*.—Like the people of the neighboring countries, the Israelites were polytheists and idolaters for centuries until about 625 B. C., when Hilkiah, a high priest in Jerusalem, went to King Josiah with a book which, he said, had been found in the temple. It purported to be a divine revelation, written by the famous ancient prophet, Moses, a record of a covenant made between the god Yahveh or Jehovah and the Israelitish people, with the promise of exclusive devotion on one side and of exclusive celestial favor on the other. This book, now known to us as Deuteronomy, was submitted for investigation to a woman fortune-teller who declared it genuine and sacred, and thereupon the King accepted it as the fundamental law of his state. It introduced new ceremonies, festivals and doctrines, and organized a new and exclusive priesthood,—nominally the descendants of Levi, practically the family of Hilkiah, and organized a new religion.

Before the novel ecclesiastical system could be fully established, the Jews were conquered by the Chaldeans, and all their leading men were de-

ported with their families to Babylonia, where they and their descendants were kept in bondage nearly a century and a half. During this time they were allowed to retain their separate existence as a people, their speech, their priests, and their sacred book, which last was read to them at their meetings on the Sabbath day. In their captivity they became faithful to Yahveh as they had never been before.

After Babylon had been taken by Cyrus, the Jews in its vicinity were treated with favor because they were not dangerous to Persia, and yet were numerous enough to serve as a check on the Chaldeans, whom they hated. In 458 B. C. the Persian King permitted and helped about 40,000 of them to return to Judea under the command of Ezra, one of their priests, who was clothed with despotic power in political and ecclesiastical affairs. He did not waste his opportunity, but restricted the privileges of owning land and holding office to Jews, established a new priesthood, descended from Aaron, and forced the people to accept a new sacred book, Leviticus, which contained many new ideas. He compiled or revised the historical records of the earth and of Israel, and did more than any other person to put the Pentateuch into its present shape.

That book is monolatrous, not monotheistic. It commands the exclusive worship, but does not teach the exclusive existence of one God. Its lim-

itation of divine favor to one nation, of sacerdotal office to one tribe, and of divine worship to one city may be excusable in a national, but would be out of place in a universal religion. In accordance with the custom of oriental priests in their times, the authors of Pentateuch asserted that their divinity was not only the most powerful of all the gods, but that he had made the earth itself.

Many of the ecclesiastical ceremonials of the older Egyptian religion were copied, but its teachings of a future life with rewards and punishments were rejected by Judaism, which limited the dealings of God with man to the mortal life. The Pentateuch and the prophets have nothing to say of a future existence, or eternal salvation, or a plan of redemption, or an atonement for the sin of Adam, or the communion of the saints in heaven or the torment of the sinners in the fire and brimstone of hell under the charge of the devil and his angels. All the promises and all the threats of the Mosaic books are limited to the earthly life. The belief in a future existence with its happiness and misery under sacerdotal control added greatly to the wealth and power of the priests, and its rejection by the authors of the Jewish sacred books, for reasons not now discoverable, is a subject for wonder.

Sec. 41. *Christianity*.—In the reign of Tiberius, the conditions of the Roman empire made a demand or at least an opportunity for a new reli-

gion. During more than half a century, peace and prosperity had prevailed from the Atlantic to the Euphrates on both sides of the Mediterranean. Commerce, wealth, education and refinement were making rapid progress. The local gods were falling into discredit. Zeus, Athena, Diana, Apollo, Baal, Moloch and Osiris had failed to maintain their independent nationalities, had thus violated their obligations to their worshipers, and lost much of their hold on the popular faith. Many educated men accepted the doctrines taught for centuries by philosophers that there was only one God and that he cared not for smoking altars.

If any Greek or Roman had clearly seen that a new and universal religion was wanted in his time, he might have been unable to devise one that would have been adopted by the people. He would probably not have known how to frame an ecclesiastical system adapted to the wants of his time, and to attach it to some old system in such a manner that it should not give insuperable offense, by its suggestion of novelty which, in such matters, is, to mankind generally, most offensive.

That which neither Greek nor Roman did to supply the ecclesiastical want of the empire was done in a most tactful and successful way by a Jew, but not by the one after whom the new religion was named. Of Jesus himself we know little. He was born in Nazareth, perhaps about 5 B. C. and, like his father, was a poor and unedu-

cated carpenter. A year or two before his death, which occurred not earlier than 33 nor later than 35 A. D., he went about the country claiming secretly to be the Messiah of Jewish prophecy, who was to restore and rule the kingdom of Israel. Before he had completed his plan and obtained the anointment necessary to qualify him for the royal office, he was betrayed, arrested, convicted, and crucified for the crime of rebellion against Rome, and, according to custom, the character of his offense was indicated by an inscription placed on the cross.

His followers, being few in number and without learning or wealth, were not prosecuted. They formed a sect, the main purpose of which seems to have been to pay reverence to the memory of their master, but our information about their tenets is not satisfactory. We know nothing of them except from their enemies. They continued to observe the Mosaic law and worship in the temple, and did not preach a new religion. They did not adopt a distinctive name nor frame an explicit creed, nor ordain a clergy, nor publish any books giving an account of the life of Jesus.

Sec. 42. *Paul.*—They regarded themselves as a distinct sect, called Galileans, sent out missionaries to make converts, and provoked the opposition and animosity of the orthodox Jews. One of these latter, Paul of Tarsus, while on the road to Damascus, where he intended to preach against the Galileans,

leans, had a fit, perhaps epileptic, in which he supposed that Jesus appeared to him and ordered him to preach a new religion, the religion of Christ.

Instead of going for instruction to Jerusalem or Nazareth, to the Twelve who had been the trusted companions of Jesus in his public career, or to the mother and brothers of his Lord, Paul went to Arabia, and there in solitude prepared himself for his missionary labors, which were to last for a quarter of a century, and to establish Christianity on a solid foundation. He preached a religion which had been revealed to himself exclusively, and had never been taught while Jesus was on earth. It had a universal god and a spiritual worship, the best rudiments of which were found among the Jews who, in the Roman empire, were the only worshipers of one God, the only people who met every week for purposes of devotion and religious instruction, and also the only people who had a sacred book, portion of which was read to them every Sabbath. Thus it was that the universal religion needed in the Roman empire was grafted on a Jewish stock by a Jew.

Paul wrote a number of ecclesiastical epistles which are the only certainly genuine portions of the New Testament, and threw into them much force of expression, fervor of emotion, and comprehensiveness of thought, crowding into them all the ideas that seemed to him necessary for a knowl-

edge of "my gospel," as he called it. Many doctrines prominent in later Christianity were unknown to him. To him, Jesus was a mere man, a son of David "according to the flesh," a Messiah of Jewish prophecy and expectation, who never spoke the pithy proverbs, the striking parables or the sickly, ascetic maxims that were put into his mouth by the evangelists of a later century.

Paul's churches in Syria, Asia Minor, Greece, and Italy became the foundations of the new religion, and his converts were the first to be called Christians. They transmitted their faith to later times; they and their successors gave form to the later doctrine and discipline of the church, and they gave Greek titles to nearly all its dogmas, ceremonies and offices. Messiah is the only Semitic word of much note in its vocabulary.

After the death of Paul, when the Christians had greatly increased in number, a large demand was made for a biography of Jesus, and the want was first supplied at some unknown time, probably in the early part of the IIInd century, at Alexandria, then the chief seat of Greek literary activity. Authentic information about Jesus being very scanty, the earliest evangelist, perhaps the man to whom tradition gives the name of Mark, or one whom Mark followed, used a skeleton of tradition which he covered with miracles, personal movements, instructions to the apostles and predictions about the end of the world drawn from

his imagination, and with parables and maxims plagiarized from various books, including those of Essenes, Therapeuts and Alexandrian Jews.

Other evangelists, to whom the names of Matthew and Luke have been given, wrote at unknown times and places, copied much from the earlier gospel without credit, and added something of their own, greatly exaggerating the ascetic maxims, some of which they misunderstood, and addressing to all the severe commands which were given by the Buddhists and Essenes only to those who had withdrawn from useful labor and from active life.

The fourth gospel attributed to the Apostle John, must be spurious, because it was not published by him when he should have published, if he intended to give such a work to the world, and also because its ideas are irreconcilable with those which we know that he entertained; and further, because its style is not the style in which he, an "unlearned man," as the author of the Acts calls him, would have written.

Of the four gospels not one can be traced certainly to a date before 140 A. D., and, if then in existence, they were not regarded as inspired books by such notable Christians as Justin Martyr and Papias. Their miraculous stories could not have been written in the apostolic age. Their authors seem to have had no thought that they were discrediting the Pentateuch when they

taught that divine justice was administered in a future life.

Sec. 43. *Greek-Roman Review*.—By supplying cheaper, better and more numerous tools, steel stimulated all the industrial arts and facilitated the construction of defensive walls, under the protection of which the numerous city states of Greece and Italy had their origin. These city states were the sources of constitutional freedom which in its turn awakened the energies of the people, fostered literature and ornamental art, and created a feeling of personal dignity which refused to submit to sacerdotal oppression. The local divinities were discredited by the overthrow of their respective nationalities and languages, and by the establishment of the Roman Empire with its superior literature, and law. Thus the track was cleared for a universal God, whose existence had been taught previously by the Greek philosopher. In all these changes of the Fifth Era, Industry was the chief factor and Polity was next to it in influence.

X
CHAPTER VI.

THE MEDIEVAL ERA.

Section 44. *Medieval Religion*.—In the earlier eras of this history the industrial, political and social departments of life were considered before those of the ecclesiastical, but now the order is changed, and we now examine first that branch which in the previous periods came last. Priestcraft was the main cause of the overthrow of the Roman empire, the greatest catastrophe in the career of mankind, the most characteristic event of the Middle Ages. Within three centuries, for so long this devastating revolution continued, thousands of cities were destroyed, numerous provinces were reduced from relative wealth to poverty; and learning, literature, commerce and political and social order were overwhelmed in ruin, extending from the Euphrates to the Atlantic. Between the accession of Augustus and that of Constantine, the whole empire enjoyed general peace, security and prosperity, such as the basin of the Mediterranean never had before, and has never had since. There were occasional wars for the imperial crown, but they were wars of the soldiery, not of the people.

Sectarian controversy was the necessary product, and has been the inseparable accompaniment of Christianity. Though the acceptance of the true faith is represented to be necessary to salvation, yet, according to the New Testament, neither Christ nor any of the apostles ever defined that true faith; and Paul and Peter made it the subject of disputation, which continued to grow wider in range, more virulent in tone, and more pernicious in influence for century after century.

Soon after Constantine publicly announced his conversion to Christianity, he summoned a council of bishops to decide the question which had originated in Alexandria, whether the Son, as a divine personality, had existed before his incarnation in Jesus. The Council met at Nicaea, Asia Minor, in the year 325, and declared, in accordance with the wish of the emperor, that the Son had existed from all eternity, and added that he was consubstantial, with the Divine Father. The emperor expected that the defeated party would submissively accept the decision of the majority of bishops, but was disappointed. The doctrine declared heretical by imperial authority continued to count its adherents by millions. The orthodox demanded the enforcement of the decision by persecution; and the bishop of Alexandria, Athanasius, their leader, was so insolent in his dictation, that the emperor turned about, accepted 'the Arian creed which had been condemned by the council,

drove Athanasius into exile and persecuted the Athanasians during the last ten years of his reign. His successors on the throne of the Eastern empire, Constantius and Valens, pursued the same policy with increasing severity, through thirty-eight additional years, making forty-eight years' of continuous Arian domination in the Greek portion of the empire.

Sec. 45. *The Fall of Rome.*—Such was the situation of affairs when a large horde of Arian Goths, whose homes had been on the northern bank of the Danube, crossed it to escape from pursuing Huns and begged leave to settle within the limits of the empire under the shelter of the Roman arms. The imperial officers insulted and oppressed the suppliants until the angered Goths in 378 attacked a large army near Adrianople, completely defeated it and slew the emperor Valens on the field of battle. No new army was collected to oppose them; for months no successor or claimant of the throne appeared. Instead of taking advantage of their opportunity to plunder the cities and provinces, the victorious Goths contented themselves with occupying the lands which they wanted, and settled down there quietly, thus proving that they had crossed the Danube as friends not as enemies.

The vacant throne of Constantinople was given by Gratian, the Athanasian emperor of the West, to Theodosius, a Spanish general, who for several years carefully avoided everything that would

have offended his Gothic subjects. As soon as his army had been reorganized and he felt secure in his place, he persecuted the Arians who in the East had long been the persecutors, and he also persecuted the heathens who were still numerous in the cities as well as in the rural districts.

The death of Theodosius in 395 was followed by a triumphant Teutonic invasion. With an army of Arian Goths collected north of the Danube, Alaric avenged the persecution of his fellow-believers by overrunning and plundering Thrace and Greece and then, having been bought off by the Eastern emperor, he marched westward and ravaged Italy from the Alps to the Strait of Messina. By permitting him to sack Rome, the Western Empire confessed its inability to defend itself; and soon afterwards, the Teutons began to cross the Rhine, the upper Danube and the English Channel, in a long succession of hordes,—including women and children,—which overran, devastated and permanently occupied Italy, France, Spain, England, Carthage, Numidia and Mauritania. Within less than a century after the death of Valens, these barbarians had swept away the laws, the administrative system, the cities, the schools, much of the wealth and population and most of the literature and refinement of all the Latin provinces. By adopting a persecuting policy while a majority of its subjects were heathens and heretics, the imperial government unfitted itself for the struggle of

national life, and invited the triumph of Teutonic barbarism.

As the empire of the West was overthrown by the Teutons so was that of the East, some centuries later, by the Arabs, who took Syria, Mesopotamia, Northern Africa and Spain with wonderful ease and celerity, and afterwards conquered the Greek provinces in Europe. The Byzantine monarchy had persisted in the policy and enlarged the scope of its persecution, and had thus offended most of its Asiatic and African subjects so much that they welcomed the Moslems as deliverers and many of them soon became converts to the religion of the Crescent.

Sec. 46. *Medieval Councils.*—The general council convened by Constantine in 325 did not accomplish his purpose of terminating all doctrinal controversies in the new Church by completely defining the creed of Christendom. The religion of the “Prince of Peace” became the most prolific source of ecclesiastical discord. It bred new heresies and new persecutions in every generation. Within four centuries, six general councils, which are accepted as authoritative by the Roman, Greek and Anglican sects,—they dignify themselves with the name of “churches,”—were held in Constantinople or Asia Minor. All were convened by the emperor, were presided over by a bishop whom he designated, and were controlled in their action by his wishes. All had a large majority of eastern bish-

ops; all conducted their discussions and kept their records in the Greek tongue. The first at Nicaea in 325 declared that the Son is consubstantial and coeternal with the Father; the second, at Constantinople in 381, recognized the equal dignity of the Holy Ghost; the third at Ephesus in 431, asserted that the Son has two natures, one complete in its humanity and the other complete in its divinity, and that Mary is properly entitled "the Mother of God"; the fourth at Chalcedon established the dogma that Jesus had two separate wills, one belonging to his human and the other to his divine nature; the fifth at Constantinople, in 553 and the sixth at the same city in 681 made no noteworthy addition to the creed. The last of the eastern councils accepted by Rome but rejected by the Greek Church, held at Nicaea in 781, ordered that the images of Jesus, his mother and the saints shall be set up in the Churches to be "worshiped and kissed, but without that peculiar adoration reserved for the invisible and incomprehensible God."

The canon of 431 that Jesus has two distinct natures, human and divine, declared that many of the people of Asia Minor, Syria, Armenia and Mesopotamia were heretics, and must be persecuted; and the canon of 451 that Jesus had two wills condemned the Egyptians in like manner, and thus prepared most of the people of those extensive and important provinces to welcome some

master less intolerant than the Byzantine emperor.

While these doctrinal follies were spreading, while persecutions, riots, insurrections and invasions were becoming more numerous and destructive, and while commerce and education were declining, crucifixes, pictures and images became prominent emblems of increasing superstition. The saints were associated with the Trinity as objects of worship. The people kneeled before their images, kissed them, decorated them, prayed to them, made vows to them, paid their debts under these vows, and not unfrequently cursed the images and threw them out or burned them when the saints failed to grant the solicited favors. The Christian saints were treated exactly in the same manner as the heathens treated their local divinities. Every country, every city and every person had his or its patron saint. The bones, clothes and trinkets of holy characters were enclosed in costly shrines, exhibited to the people for reverent regard at great festivals and declared to be talismans of miraculous power. The sale of saints' relics and the forgery of documents to prove their identity became profitable occupations. Different churches had skulls and skeletons of the same saint. There was enough wood of the "true cross" to load a ship. Sacerdotal trickery and popular credulity reached their highest developments in this business of sacred relics.

For more than a century and a half, Arianism

was dominant in all the Latin provinces,—in Gaul, Spain, Northern Italy, Mauritania, Numidia, and Carthage; but many of the bishops were Athanasians, and one of these converted Clovis, the prince of the Franks, who took his army with him into the communion of Rome; and he and his successors induced or compelled all the other Teutons of Western Europe to follow his lead, thus extinguishing Arianism in the west, as it had been or was to be extinguished in the East.

Sec. 47. *Papal Opportunity.*—The middle of the VIIIth century—about 750—was a turning point in ecclesiastical history. Then the Greek and Latin churches separated from each other; the Teutonic began to predominate over the Byzantine influence in the sacerdotal councils; the theory of the papal primacy began to find favor among princes and priests; and Western Catholicism began to have a separate creed.

About that time a number of events removed the obstacles which had previously obstructed the ambitious designs of the Roman bishops. The overthrow of the ancient learning had left an ignorant and superstitious people in the Latin and Teutonic regions ready to become the victims of cunning priestcraft. The abandonment of the Latin tongue in the East, the decay of Greek in the West, and the political hostility between the two divisions, destroyed the influence of the Byzantines in Italy and France. The patriarchs of Constan-

tinople, Alexandria and Antioch, who had been equal in power to their colleague of Rome, were discredited by their acceptance at one time or another of some great heresy condemned by a general council; and those of Antioch and Alexandria had been reduced to relative insignificance by their submission to Moslem domination. These degradations of all the other patriarchs, left the one in Rome in a position of relative aggrandizement, and then he abandoned the title of patriarch which suggested equality with others.

The conquest of Northern Africa by the Arabs destroyed the Christian church of Carthage, the greatest Latin city after Rome, which was thus left without a rival in the West. The conversion of Clovis, the King of the Franks, to Athanasianism at a time when nearly all the western provinces were subject to Arian princes, and the wonderful success of the Frankish monarchy in establishing its dominion over Gaul and Germany and over most of Italy, added vastly to the influence of the Roman bishop. Pepin, the commanding general of the Franks, wanted the Pope to recognize him as King, and Stephen bishop of Rome wanted Pepin to protect him against the encroachments of the Lombards and to recognize him as the head of the Catholic Church. Each did what the other demanded and each gained much by the mutual service.

While the Papacy was trying to obtain as much

as possible from the Frankish monarch, a Roman priest about 754, forged a document called the Donation of Constantine, purporting to be a grant to the Pope of complete political dominion over Rome and the adjacent country, made by the Emperor Constantine when he was baptized at Rome in 325 by Pope Sylvester. This document was published by the bishops of Rome as genuine, and was so regarded by all Latin Christendom for seven centuries; but after the revival of learning in the XVth century its forgery was exposed. Constantine was not baptized in Rome, nor in 325, nor by Sylvester, nor by any Roman Catholic bishop; various phrases in the Donation, such as "universal bishop" were not used in the IVth century; and there is no record or reference to such a grant in the imperial records, or in contemporaneous histories, such as those of Eusebius. The forged character of the document is now universally admitted.

Another remarkable sacerdotal fraud, produced by the papal clergy for their own profit, and used with much effect to exalt the See of Rome, is the collection of Forged Decretals published about 850, and accepted by Pope Nicholas I who asserted publicly that these documents were correctly copied from the Papal archives. With such attestation, they were made part of the code of papal law, and for six centuries were accepted as genuine by all the Popes and leading authors of the Ro-

man Church. They included seventy clauses, now universally recognized as forgeries, all designed to increase sacerdotal influence.

After the West had separated from the East; after the Greek metropolitan Sees had been discredited, leaving Rome with the exclusive credit of superior orthodoxy; after Africa had ceased to be Latin and Christian; after ignorance and superstition had obtained sway over all Western Europe; after the popes and the Frankish monarchs had made their alliance; after the Frankish monarchy obtained direct or indirect control of nearly all the countries that accepted Latin Christianity;—after all these events had occurred then and not until then came the time when the False Donation, the Forged Decretals, the fraudulent interpolation in the gospel of Matthew about the keys, and the false tradition that Peter had been bishop of Rome, served as a foundation for the superstructure of the Roman primacy.

Sec. 48. *Papal Domination.*—The XIth century made two great changes in the ecclesiastical discipline of Latin Christianity, by establishing the College of Cardinals and by enforcing sacerdotal celibacy. As compared with its claim and the belief, general among Catholic peoples, of its divine authority to control the future fate of mankind, the Papacy was weak in Italy because its popes were chosen by the clergy and people under the direction of the nobles of Rome. These nobles,

caring for their own interests, usually gave the tiara to men who had neither the character, the capacity, nor the ecclesiastical learning needed in the office, and who lacking these qualifications, could not obtain much power in their own city. Hildebrand, a monk,—he afterwards became Pope Gregory VII,—seeing the evil and the method of remedying it, secured the adoption in 1073 of a rule that the election of the bishop of Rome should be given to the Cardinals, then seven Roman prelates, selected for their ability and for their fidelity to sacerdotal interests. This method of election gave the papal office to men of sacerdotal training and spirit though in many cases of narrow minds and base morals. After Hildebrand reached the Papacy he issued a decree that the priest should have neither wife nor acknowledged concubine and, against great resistance, he enforced it or gave it such a sanction that it was afterwards enforced. Thus he cut the priests loose from secular influences so that the later popes could effectively use the clergy as a well-disciplined sacerdotal troop against kings and princes.

Encouraged and strengthened by their successes in these innovations, the popes undertook to domineer over all Christian countries. Pretending to be the vicegerents of God, they claimed super-national authority to decide finally all questions of private or public right and duty, to define all moral and political obligations, to annul oaths

and treaties, to direct all governmental acts, to repeal and confirm laws, to take and give away crowns and kingdoms, to dictate and exact coronation oaths and to make and administer all laws relating to marriage, education, wills, inheritances, perjury, the title and taxation of ecclesiastical property, and the privileges and the crimes of priests. They not only stated such claims in letters, bulls and law books, but, in many cases, taking advantage of the ignorance, the folly and the weakness of princes, they enforced them. They compelled sovereigns of Germany, England, Naples, Poland, Hungary, Castile and Aragon to acknowledge themselves vassals of the Roman See. They required many monarchs of great countries to humiliate themselves by going down on knees and elbows like slaves to kiss the pontifical slipper. In 1077 Pope Gregory VII allowed the German Emperor Henry IV to stand through three successive days barefooted in the snow begging pardon for having installed bishops by ceremonies which his imperial predecessors had used for four centuries. In 1170 Pope Alexander III compelled Henry II of England to submit to scourging at the tomb of Archbishop Becket, who had disturbed the peace of England. In 1152 Pope Alexander III crowned the kneeling Frederic I Emperor of Germany, and, after doing so, placed his foot on the emperor's neck in token of his complete mastery, and an attendant cardinal, who had

evidently been instructed for the occasion, quoting a scriptural passage, said: "Thou shalt tread upon the cockatrice and crush the lion and the dragon." In 1190 Pope Celestine III placed the crown on the head of the kneeling German Emperor Henry VI, and before the monarch could rise, kicked it off.

The super-national claims of the Papacy caused destructive wars and provoked angry protests from sovereigns and national councils in Europe. The constitutions of Clarendon issued in 1164, and the statutes of Praemunire in 1353 and Provisors in 1390 were all adapted to check the interference of the popes in the national affairs of England. The Pragmatic Sanction of 1264 and the Declaration of the States General in 1302 had similar purposes for France. Even as late as 1688 the French government considered it necessary to make a public declaration that in secular affairs the Sovereign owed no obedience to Rome. A similar declaration was made in Germany, which country had been kept in a condition of civil war during a large part of two centuries by large armies under the control of the bishops who favored the policy of Rome. The Papacy pretends to abhor blood, but during five centuries was the most active provoker of warfare in Europe.

Sec. 49. *Celibate Orders*.—The Roman Church has been more successful than any other ecclesiastical organization in the management of celibate

orders, and has formed them in larger size, in greater number, and for more varied purposes, and has enabled them to acquire more wealth, influence, learning and strictness of discipline. St. Benedict established the first Roman Catholic monasteries in the VIth century, and introduced the novel rules that the vows of poverty, obedience, and chastity should be irrevocable, and that the monks must dwell in seclusion, and spend their waking hours in agricultural labor or ceremonial worship. The Benedictine order reached its highest influence in the XII century, when it had 300,000 members and 15,000 monasteries, many of them possessing thousands of acres of land, hundreds of serfs and much wealth. The monk was pledged to poverty, but the monastery was not, and the abbot was, in many cases, a noble who lived in great style and was not much hampered by his vows. There were Benedictine nuns as well as monks, and neither class did much to raise the general standard of education or morality.

In the beginning of the XIIIth century, Francis of Assisi formed the plan of a celibate order which should render more service to the Roman Church than did the Benedictine with its rich monasteries, its great wealth, the exclusive devotion of its sincere members to their own salvation, and the gross worldliness and debauchery of many if not most of its abbots and chapters. His followers vowed

themselves to poverty not only as individuals but also as a corporation, to live by begging, to dress in the simplest manner, to devote themselves to missionary work, and to plan their work in congresses of elected representatives to be held once in three years. He made no provision for educating members, and his "friars" or brothers,—they were not monks, as they did not usually dwell in monastic institutions,—were the most ignorant of all the classes of Catholic celibates.

While the Italian Francis of Assisi was planning his order, Dominic, a Spanish priest, was thinking of another, which was soon founded and became that known as the Dominican. In imitation of the Franciscan it was composed of mendicant friars, whose business was to convert heathens and heretics; but Dominic provided that all his friars should be educated theologians, competent to defend the Papal doctrine against learned controversialists; and for three centuries they were the leading teachers of the doctrine and ecclesiastical history of Rome. Both these orders increased very rapidly in numbers and influence for two centuries after the organization, while the Benedictine order declined in credit; and all contributed much to the wealth and political power of the Papacy.

Sec. 50. *Learning Hated.*—The Medieval Christian clergy hated learning and literature. They discouraged the study of science and political his-

tory, and the composition of epic and dramatic poetry. Directly or indirectly they destroyed half of the ancient Greek and Roman literature; while they were its custodians they allowed it to be lost. They broke up the academies of Athens, Alexandria and Edessa, and law schools of Rome and Berytus, and did not establish others of their own. They did not even attempt to replace the libraries which had been destroyed at Alexandria and Per-gamos while they were in power there. They were disgracefully ignorant. Most of their monasteries were dens of idleness and vice. They did not take a leading part in organizing the first universities of Western Europe,—those of Salerno, Bologna and Naples. Not one of their medieval monastic orders made it a duty to teach outsiders, or to give a high general education to their members, or to spend much time in literary labor. In Latin and Teutonic countries they made it a rule that such instruction as they gave should not be in the vernacular tongues, thus rendering it worthless to the multitude. They contributed nothing to the development of any modern language. Neither Tuscany, nor Castile, nor Provence, nor England is under the least obligation to any Christian prelate for a valuable contribution to its vernacular medieval literature. When the revival of learning began they did not distinguish themselves by collecting ancient manuscripts and studying the Greek and Hebrew tongues, nor did

they encourage such labors by promoting to high office the men who engaged in them. Everything that zealous friends of learning ought to have done, they neglected or refused to do.

As the income of a church was in many cases proportioned to the popular belief in the genuineness of its relics and in the efficiency of their supernatural powers, so its priests were directly interested in reporting that numerous great miracles had been wrought at their shrines, and in forging records to verify these wonders. Sacerdotal fraud and popular credulity were the sources of an immense supply of bones and other relics and of fictitious lives of imaginary martyrs.

Sec. 51. *Clerical Greed.*—In their greed for wealth, the medieval Catholic priests were highly successful. They acquired nearly, if not quite half, the revenue of the Latin and Teutonic countries. They owned one-third of the land in France, Germany, England, Italy and Flanders; and an equal proportion of the people in those countries were their serfs. They exacted, in tithes, one-tenth of the gross income of the land which they did not own. They sold masses for releasing souls from purgatory, to which nearly every person was supposed to go. They sold indulgences which, in many cases, were licenses to sin. They advised the dying to make wills leaving bequests to the church; and as probate judges, gave or denied validity to the wills. They urged the sick to have

their wills made or witnessed by a priest, and treated salvation as marketable merchandise.

Sec. 52. *Islam*.—In the early part of the VIIth century, a new religion had its origin in the deserts of Arabia, and with the Crescent as its symbol, it rapidly triumphed over the Cross in many provinces of the East. It was the teaching of Mohammed, an ignorant man, who, as a caravan trader, had seen the Christians of Syria, and had been profoundly impressed by what he had learned of their creed, their ceremonies and their controversies. By thinking of their follies and crimes, and of his own superior wisdom and justice, he convinced himself that he was a divinely inspired teacher who was to lead the world back to the true and simple religion which, as he imagined, had been communicated to Moses and Jesus, and had been corrupted and falsified by the priests and scribes of the Jewish and Christian churches.

He saw distinctly that Christianity was greatly weakened by its complex creed, its doctrinal dissensions, its persecuting policy and its idolatrous worship, and that the numerous heretics of Syria, Mesopotamia and Egypt were ready not only to welcome alien invaders, but also to listen to new religious teachings. Having perhaps heard how the Arian Goths had easily overrun the Latin provinces, he perceived the opportunity for similar triumphs in Asia, and, believing himself competent to gain them, he established a church and organ-

ized an army for the conquest of the world. His simple faith had two main ideas,—belief in a unitarian God, and belief in Mohammed as the prophet of God. He had neither priesthood, idolatry, nor mediation between man and God. By stating his doctrines in clear terms, protecting them against amplification or obscuration, and providing that there should be no priesthood in his church, he prevented theological controversy; and by prohibiting the persecution of Christians and Jews, he induced the weaker sects in the Eastern empire to welcome his followers as friends and allies.

Mohammed did not live to enjoy the military triumph which he had planned; but that satisfaction came to Abu Bekr and Omar, his early companions and trusted friends,—men, like himself, of admirable character and superior capacity, who saw the Arabian hosts sweep like a whirlwind over wide regions of the East. They not only made great military conquests, but by strictly keeping their promises to their Christian subjects, they induced many to abandon the Cross for the Crescent. Suddenly Islam became a great power in the world. No other conquest so extensive, so durable and so complete, was ever made in so brief a period under one central authority. It was a conquest of a religion and of a tongue, as well as of a political dominion; within a hundred years it carried the authority of the Caliph from the Tigris to the Atlantic and the Pyrenees.

The wonderfully rapid and durable conquests of the Arabs were made not by superior drill, generalship, statesmanship or courage, but by greater harmony among themselves, and by greater fidelity to their oaths promising toleration to their Christian subjects. When a large proportion, and perhaps a large majority, of the people in all the Asiatic and African provinces of the Roman Empire were persecuted or threatened with most cruel persecution, they welcomed the Crescent, which soon afterwards many among them accepted as the symbol of their faith. Never was an extensive conquest so easy; never was an easy conquest so durable.

Unfortunately for culture, the Arabs were at first, and have remained till the last, a rude people. They never developed a good code of constitutional, civil or criminal law; they never acquired superior military discipline; they never established a great educational system or produced a superior literature. The Koran was a good book of religion and law for medieval Arabia, but it is a millstone tied to the neck of modern Morocco, Egypt, Syria, Asia Minor, Persia, and Mesopotamia.

Sec. 53. Feudalism.—The main political changes that accompanied the overthrow of the Roman Empire were the rise of the Teutonic and Semi-Teutonic nations to a leading influence in culture, the growth and culmination of feudalism, the ad-

vance of many medieval cities to a condition of independence or semi-independence conferring freedom on all the inhabitants, the foundation of a constitutional government in England, the substitution of serfdom for slavery in western and central Europe, and the beginning of the movement for the abolition of serfdom.

Between 400 and 800 A. D. nearly all the slaves in Gaul, Germany and England became serfs, under influences which are no longer traceable. Neither accident nor whim nor motive of brief duration or narrow influence, could have made a change so great and extensive. There seems to have been a general prejudice against the enslavement of orthodox Christians, but the difference between the condition of many serfs and some slaves was slight. No monarch forbade slavery; no medieval pope or council declared it sinful. Many bishops and abbots owned numerous serfs and continued to own them, even in the XIXth century. Late in the XIXth century the Papacy, through Leo XIII, proclaimed the principle of morals that slavery is sinful and the rule of discipline that the slaveholder cannot receive absolution,—a principle and rule new in the Catholic Church.

The serf was a hereditary bondsman, a piece of personal property, so attached to the soil that neither he nor it could be sold separately. The conditions of his bondage varied in different countries or estates, but usually he was required to

give to his lord a large proportion of the crop and also to render many personal services. He could own property and transmit it to his heirs, but, with rare exceptions, he was extremely poor, and was greatly oppressed by the privileges of the superior classes.

When they crossed the Danube, the Rhine, or the English Channel, to enter the Roman provinces, the Visigoths, Ostrogoths, Suabians, Vandals, Burgundians, Lombards, Saxons and Franks were equally ignorant of written law, city life and orderly government, and so remained until they had been educated by long contact with their Latin subjects. For several generations they did not know enough to combine their forces for the purpose of protecting themselves in their new possessions; and the consequence was that they were plundered and impoverished by a long succession of other invaders; and three or four centuries elapsed before new cities and new fortifications gave security against pillaging incursions.

The first Teutonic governments in the Latin provinces were organized on principles similar to those of a military encampment, supported by contributions levied on the subject people in the neighboring country. In some districts the conquerors took two-thirds of the land, in others one-half; in some they reduced the Romans to bondage, in others left them free. The military leaders seized large tracts of land and became nobles

whose chief occupation was fighting with one another when no other enemy absorbed their attention. Their military organization became the basis of their political administration which in the VIIIth century developed into feudalism. Under this system the sovereign was regarded as the owner of all the land which he leased to his tenants-in-chief, who in return served him in arms and paid him with money or agricultural produce. These vassals were required to swear fealty to the monarch, to follow him in war with their troops, to attend him in his court, and to contribute to his wants in emergencies. Those among them holding large estates, leased portions to sub-vassals who owed similar services to their immediate lords. The vassals and sub-vassals were noblemen, never commoners, much less serfs.

The land leased by a lord to a vassal was a fief, at first held like a military commission, subject to revocation, not inheritable, and not conferred on a woman or a child. In the IXth century, after the long continued and frequent invasions from beyond the Rhine had ceased in France and Italy, and after industrial and political conditions improved a little, the fiefs became hereditary, and the larger ones semi-independent. Their lords exercised all the attributes of sovereignty except that of refusing obedience to their feudal superiors. They organized troops, exacted oaths of fidelity, made war on fellow vassals or aliens, built

castles, coined money, collected discretionary tolls from persons crossing their territory, and exercised unlimited control over the lives, freedom and property of the people living on their lands.

The fundamental maxim of feudalism was that every spot of land, and every man, except the sovereign, must have a lord. The whole country must be divided into fiefs, each held by its vassal of high or low degree, the lowest having perhaps three hundred acres, of which one-half or one-third might be cultivated, and the highest having a hundred thousand acres or more. Some of the great vassals were bishops and abbots, who had their troops like secular lords, and led them in war or gave command of them to subvassals. Bishops were lords of most of the larger French and German towns before the time of Charlemagne.

Feudalism was a barbarous institution, hostile to peace, nationality, the growth of towns and the development of industry, and, though it was full of the militant spirit, it obstructed the development of discipline. It called soldiers into service for only short periods. It distributed commands not according to capacity but according to the number of acres. It allowed the nobles to engage in private wars with one another, and thus filled them with animosities that rendered them incapable of cordial combination against a foreign enemy. It drew strong lines of dialect and prejudice between adjoining provinces; it led to varieties of usages

and laws; it gave independent legislative and judicial power to all the great vassals; and it proved the general truth of the maxim that the smaller the dominion of the tyrant the more cruel his administration. Feudalism allied itself instinctively with its kindred medieval institutions of serfdom and the Papacy. During the centuries in which it was powerful, all the popes were its allies. They not only never denounced it, but they did their best to aid its extension and perpetuation. They made false and impudent claims to be the feudal lords of Germany, England, Ireland, Scotland, Castile, Aragon, Hungary and Naples, and for centuries a considerable part of the papal revenue was derived from immense fiefs cultivated by serfs and owned by bishops and abbots under papal commission.

One of the most characteristic features of the Medieval Period in Europe was the general prevalence of warfare. For many centuries neither France, nor Germany, nor Italy, nor England, nor Spain enjoyed secure peace. The invasions of different Teutonic nations continued from 400 till 700, in some countries even longer, and were accompanied by conflicts of nationalities, laws, languages and creeds all tending to foster animosities and hostilities. The cessation or interruption of the invasions was followed by the establishment of the feudal system with its castles, petty despotisms, and private wars. Yet these extensive hos-

tilities continued for centuries without leading to military excellence. Their troops were mounted knights who made a grand show in tournaments but a poor one in the battle field. Drill, which is necessary to superiority in warfare, has never been highly developed in cavalry; the most formidable armies have always consisted mainly of footmen. The men with spears, pikes, and bows inflicted the most disastrous defeats of the XIIIth, XIVth and XVth centuries on the horsemen of France, Burgundy and Granada.

Although the Crusades failed in their main purpose of establishing a durable Christian state in Palestine, and though they were extremely wasteful of blood and money, yet they did much good by disturbing and weakening the feudal system, sending many thousands of semi-barbarous Teutons into countries of superior refinement, educating them in military discipline and political organization, stimulating maritime commerce and enriching the chief seaports of Italy.

Sec. 54. *Cities*.—Feudalism and city life were irreconcilably hostile to each other; as the latter gained strength, the former declined. The great lay noble would not dwell in a town; its walls were not under his exclusive control; its people did not live in harmony with his military dependents; and it did not contain pasture for his horses. He preferred to make his home in his castle where he had absolute control, congenial

companionship and abundant space for his equestrian exercises. The town hated the noble because he held men in bondage, levied oppressive tolls, plundered traveling merchants and made the roads insecure. On one side were freedom and commerce, on the other serfdom and war. Ultimately the industrial triumphed over the military influences; the cities multiplied and grew strong, and feudalism decayed. The medieval city fostered the spirit of liberty. Unlike the ancient city, it tolerated no bondage among its permanent residents. By spending a year and a day within its walls, the refugee serf became a freeman.

At the close of the IXth century nearly all the larger towns of France, Germany, the Netherlands and Northern Italy were fiefs or portions of fiefs held by bishops as feudal lords; and before the XIVth century most of them had been liberated from feudal authority, though in many cases not until after bitter struggles, in which the town and the sovereign had combined on one side against the ecclesiastical and military nobles on the other. The cities of Northern Italy were the first to throw off the feudal yoke; but the records of the municipal revolutions in that region have not been preserved. The main results were that in the cities serfdom disappeared, fortifications were strengthened, the governments became republican and the freemen were soldiers for purposes of defense.

When they were first organized all the medieval cities of continental Europe, not under the control of a feudal lord, were governed by an aristocratic council, which had authority to prescribe the methods of electing its members. In some cities the councilors held for life, and when one died the others gave his place to his eldest son or other chief male heir, thus making the office hereditary in certain noble families. In other cities the council filled the vacancy, limiting their choice to the few owners of real estate, or the councilor was elected by an assembly of nobles. Among many diversities which do not require description here, the rules were general that the poor, who were the majority, were excluded from a share in the government; and that either the franchise or membership in the council was hereditary. Many of the municipal aristocracies were disturbed by social and industrial changes. Some noble families died out; others lost their wealth, and married into plebeian families, which they tried to elevate into their own privileged class. The aristocracy which prudently fortified itself by admitting the ablest and richest commoners held its power; the one which strictly guarded its noble blood against admixture with that of the subject multitude, was in many cases overthrown and disfranchised if not banished. The most liberal aristocracies,—that is those which admitted the largest proportion of residents to a share in the government,

and those which most frequently admitted plebeians into the patrician class,—had the most stable constitutions, the most economical administrations, and the longest periods of high prosperity. On the other hand, every large medieval city of France or Germany which became democratic and allowed the multitude to select its council, fell, sooner or later into a condition bordering on anarchy, from which it was compelled to take refuge in aristocracy or despotism.

The medieval cities generally had oppressive privileges. Outside of the walls within four miles, nobody could maintain a mechanical shop, an inn, or a trading house of any kind. Within that distance no foreign merchandise could pass without being brought into the market place, unpacked and offered for sale. In the city no one could be a merchant or a mechanic without the consent of the guild which controlled his branch of occupation.

Sec. 55. *Venice*.—Of all European States, the republic of Venice was the most durable and internally the most peaceful. For a thousand years she maintained an aristocratic form of government without a violent revolution, and without a conquest by foreign enemies. She was more permanent than Sparta, more peaceful than England. Though she never had 300,000 inhabitants in her capital city which was the republic,—other possessions being subject provinces,—she was for four

centuries one of the great powers of the world. She owed her start to her situation on several small islands, inside of a line of other small islands, surrounded by narrow and intricate channels, at the end of the Adriatic, where she was near the head of navigation on one of the main routes between the Orient and Northern Europe. Her watery bulwarks protected her throughout the Middle Ages against invasion, and contributed much to the security of her property and the steadiness of her government. As the islands of her city's site had no agricultural resources, her people depended for their support almost exclusively on their traffic, fisheries and manufactories; and her rich men were merchants who traded in their own ships to foreign ports, and became skillful managers of men, and by their accumulated experience were qualified to control political affairs. The small governing council always had the cordial support of the hereditary nobles, who held exclusive political power and the multitude though not allowed to share it, always gave it their direct or indirect approval. Never did any other European government last so long without some violent display of popular discontent.

After 1319, the Grand Council, consisting of 1400 members, each the representative or head of a noble family, left the management of political affairs to a small council of Two Hundred, a cabinet of seventeen (usually called the Council of

Ten) and a Doge or President, all of which it elected and indirectly controlled. The cabinet, including the Doge and six secretaries, held office during good behavior; and their long experience gave steadiness and ability to their policy. The small council and the cabinet were chosen by the Grand Council. Much complaint has been made by foreign critics that the Cabinet was tyrannical and cruel, but the nobles generally and the common people of Venice seem to have been satisfied.

Sec. 56. *Florence*.—In the XIIIth, XIVth and XVth centuries, Florence was the chief center of literature and ornamental art, and was also noted for her extensive manufactures, her large banking capital and her liberal and able government. The causes of her eminence have never been explained satisfactorily. Her site has neither strong natural defenses, nor great advantages for traffic or manufactures. The Arno, on the bank of which she sits, fifty miles from the sea, has no commercial value now and never could have had much. She has no valuable mines in her territory. She did not enrich herself by arms; her people never distinguished themselves in the art of war. But notwithstanding the fact that the natural advantages of her position were not great, she grew rich and powerful, became the capital of the Arno basin, and developed extensive industries. She excelled in weaving and dyeing wool and silk; the lords and ladies of many courts preferred the Flor-

entine tissues to all others. Her workmen showed superior skill in making jewelry and arms; and her products in these classes were regarded as articles of luxury, and paid for in high prices. She showed that she was worthy of her prosperity. She established a liberal government, educated her common people, founded libraries and art galleries, collected Greek and Latin manuscripts, erected splendid public buildings, developed great authors and artists, and took the intellectual leadership of Europe.

Sec. 57. *Northern Cities.*—The greater part of Flanders was divided up into districts, each governed by the council of its chief city; most of these councils being aristocratic but some democratic. The cities were competitors in commerce and manufactures, and there was so much bitterness in their rivalry with one another, that they could not coöperate cordially in polities; and therefore the medieval Flemings, though far superior in general education and intelligence to the English of their time, could not organize a strong national government.

The municipal corporations of England had dull careers as compared with those of Italy and Germany, because they were never independent or semi-independent states, and also because they were kept under constant supervision by the king and the parliament, so that if any one of them had ventured to make a fundamental change in its

system of government, its charter would have been confiscated promptly.

More than a century elapsed after the leading cities of Lombardy and Tuscany had established their independence before similar movements became prominent in Germany and France, and because of this later date we have more information about the development of municipal freedom north of the Alps. Each town began its struggle alone, but in many cases was assisted by the monarch when he was engaged in some quarrel with the clergy, as he was frequently. With the help of the emperor most of the German cities became independent in the management of their municipal affairs. All these governments, when first organized were aristocratic, and many of them repeatedly amended their charters so as to enlarge or restrict the number of voters. As in Greece and in Italy so here the liberal aristocracies were the most stable and peaceful; the advanced democracies had violent revolutions and bloody civil wars.

In France the struggle for the emancipation of the towns was similar in general features to that in Germany, but did not continue so long nor go so far. The kings granted charters; the bishops claiming feudal lordship resisted; the popes issued briefs annulling the royal grants of municipal freedom; and the people drove out the priests, and in some cases slew the bishops. After events

had taken this course in a dozen cities, and after the struggle had continued through half a dozen reigns, the Kings in the XIIIth century, became fearful that the towns would be too independent, turned against them, revoked their charters, installed royal officers as municipal rulers and thus checked the development of free institutions in that country. England had no contests between her towns and her bishops. When William the Conqueror distributed the fiefs of his realm, he took care to retain the cities and large towns within his immediate jurisdiction and to keep the bishops in subjection to the royal power, so that the priesthood had no excuse for interference with the issuance of municipal charters.

Sec. 58. *English Liberty*.—In the Middle Ages, Italy had no national or provincial council comprising delegates from many cities. Neither had Switzerland, which then had no acknowledged national independence and no federal council. Germany had a Diet, comprising representatives of its free cities which acknowledged their subjection to the Imperial government, but this Diet had little power in public affairs. Nearly a hundred years before commoners sat in the English parliament, representatives of towns were members of the Castilian Cortes, without the consent of which no law could be enacted and no tax levied in that country; and similar constitutional principles were established in the adjacent kingdom of Ara-

gon, but political freedom was not based on a secure foundation in either of these states, neither of which had a representation of the rural districts, or extensive suffrage in the towns; or a basis for a cordial union between the small nobles and the commoners. In both the aristocracy assisted the King to overthrow constitutional guarantees.

The political and civil liberties established in England between 1066 and 1450 are the foundation or model of the free institutions enjoyed by the civilized nations of the present day. Much was done for popular rights by ancient Greece and Rome and by various states of Continental Europe in the Middle Ages, but these achievements were nearly all wiped out by later despotisms or were superseded by the adoption of the higher British liberties.

The distinctly traceable history of the English constitution may be said to begin with the Conquest in 1066. At that time the great majority of the people were serfs. The country was divided into manors, each under its feudal lord, who was the judge in his domain with jurisdiction over petty offenses. High crimes and important property rights were decided by the hundred court, with the aid of a jury composed of representatives from all the manors,—from five to twenty—in the hundred. Every town,—which might include several manors,—was required to send five delegates

to the quarterly or semi-annual session of the hundred court, an old Anglo-Saxon institution which William I maintained, strengthened and defended strenuously against his Norman barons, who tried to exercise the same absolute judicial power as was held in their time by many French nobles. He intrusted to it important financial and military business, and made it his agent for collecting his revenue and calling out his troops. Through it he allied himself with the people in resisting the feudal ambitions of his high nobles. His sons, William II and Henry I, had similar troubles with the Norman nobility and pursued the same policy of alliance with the minor nobles and the commoners. When Henry I died in 1135, leaving his daughter Matilda and his nephew Stephen to contend for the throne, with nearly equal forces, the barons took advantage of the civil war to build numerous castles, exercise sovereign powers within their domains, exact enormous tolls from passing merchandise, suppress the hundred courts, and introduce feudal disorder similar to that of contemporaneous France.

Henry II, son of Matilda, who succeeded to the throne in 1154, though only twenty-one years old at the time, soon showed himself to be an able and energetic ruler. He allied himself with the people, re-established the royal authority, battered down the feudal castles, abolished most of the feudal jurisdictions, restored the representative

tribunals and widened their basis by transferring much of their jurisdiction from the hundred to the larger shire court, which he greatly dignified and improved by sending out his royal judges in circuit to preside in them. He established at Oxford a law school under Vacarius, a professor from Bologna, so that his judges should be men learned in the law. He gave appeals from his shire courts to his High Royal Court and thus made a comprehensive and harmonious judicial system, which was not only superior to any other then in existence, but had in it the germs of the later legal development and liberty of England.

While providing that his judges must be learned men and must adopt the same principles of right and uniform methods of procedure, and must represent the royal authority in every important lawsuit, Henry II took care that the representative character of the courts should be preserved. He strictly required five delegates from every town at each session of the shire court, to take part or be ready to take part in every trial. These delegates, chosen by the freemen, the gentry and the petty barons, by acting together in the court business, came to regard themselves as having common interests and thus created an influential public opinion.

In 1176 Henry II issued a decree that no charge of felony should be tried until after an indictment had been found by a jury of twelve freemen. This

was the beginning of the modern grand jury, the jury of accusation. The trial or petty jury, at that time found its verdicts by recognition, that is not by evidence submitted to them in court but by their knowledge or belief based on observation or hearsay out of court. They were selected because they were neighbors of the accused and knew what kind of a man he was or was reputed to be.

Sec. 59. *Great Charter*.—King John, son of Henry II, who reached the throne in 1199, and reigned seventeen years, was a violent, tyrannical, false, lustful and weak man. He oppressed and insulted his subjects until they revolted against him. The great and small barons assembled in 1215, threatened to dethrone him, and compelled him to sign the Great Charter, a comprehensive statement of the principles of political liberty as then understood in England. It promised that the government should be constitutional, not despotic; that no freeman should be deprived of life, liberty or property except by judicial order based on the verdict of a jury; that the shire courts should be held quarterly by learned judges; that important suits should be tried in the shire where the property was situated or the crime committed; that no foreign soldiers should be kept in the kingdom; and that no military tax should be collected until it was approved by a national council to which all the tenants-in-chief,—the vassals holding directly from the crown,—should be summon-

ed. The rights thus guaranteed were not those of one class but of all freemen, and were conceded to nobles and commoners in a combination which, with slight interruptions, has been maintained to the present day, and has been the main source of modern constitutional law.

Henry III, son of John, succeeded to the throne in 1216, as a boy of ten years, and during his minority the government was administered by a regency, consisting of nobles who had participated in exacting the Great Charter, in accordance with the spirit of which document, they conducted their administration. After reaching his majority the king proved himself to be weak, arbitrary, and unpopular; and the nobles and commoners rebelled against him as they had rebelled against his father. The leader of the insurrection, claiming to be regent of the kingdom, called a national parliament and summoned to it not only all the tenants-in-chief, but also two knights from every shire and two deputies from every incorporated town. The parliament thus summoned held its session in 1265, and was the first parliament of England, a legislative body entirely different from any previously known in that country. Some writers have asserted without proof that it was a mere continuation of the Anglo-Saxon Witenagemote, but that body was a feudal council to which the sovereign summoned many or few of his vassals, which but few as a rule attended, and in which,

after hearing his advisers, he issued decrees or laws by his exclusive authority.

Sec. 60. *Parliament*.—The principle of representation introduced into the English constitution in the XIIIth century found so much favor among the people that it was never abandoned. In the reign of Henry III the royal council, which included all the circuit judges, separated into three departments,—the court of the Exchequer, the King's Bench and the Common Pleas. The Exchequer took charge of the royal revenue and suits relating to it; the King's Bench had supervision of the criminal trials; and the Common Pleas of the ordinary civil jurisdiction. The three courts, comprising a number of learned and experienced judges, by their mutual criticisms contributed much to stimulate the improvement of legal procedure.

Edward I, son of Henry III, King from 1272 till 1307, was one of the ablest English sovereigns, and also one of those who purposely rendered the most service in aiding the development of constitutional liberty. He made a great reform in the constitution of parliament by summoning to it not all his tenants-in-chief,—of whom there were more than two thousand,—but only the greater barons, of whom there were not more than two hundred. The holders of the petty fiefs generally could not bear the expense of attending and did not attend. The great spiritual barons, the great temporal bar-

ons and the commoners,—the last the representatives of shires and towns,—were the three estates of the realm. The small tenants-in-chief and the subvassals were reduced to the class of commoners. By convening parliament frequently and by issuing his summons uniformly to the same great barons, Edward I established, by precedent, the hereditary rights of the great nobles to seats in Parliament, and attached the highest rank in the aristocracy to the Parliamentary office, a peculiar and original feature of the English constitution. The nobility thus created belonged exclusively to the head of the house; the sons and brothers of the lord were commoners. Edward cordially accepted the main principle of constitutional government; in one of his letters summoning Parliament he said, quoting Justinian, "every measure affecting the rights of all should be approved by all."

In the reign of Edward II (from 1307 to 1327) the Parliament, which previously had been a single representative body, divided permanently into two separate houses. The Lords included the spiritual and temporal nobles; the Commons included the representatives of the shires and towns. In this reign the rules were laid down that all laws must be adopted and all taxes levied by Parliament, and that royal officers might be impeached by the House of Commons and tried by the House of Lords.

After a rebellion of the peasantry in the reign of Richard II (from 1366 to 1399) led to the abolition of serfdom, the weak character and despotic conduct of the King provoked Parliament to depose him, and give the royal office to Henry IV, in whose reign the principles were established that every freeman has a right to petition Parliament for a redress of grievances, that all bills to levy taxes must originate in the House of Commons, and that all legislation must be by bill, agreed to by both Houses. In previous reigns the representatives of the shires and towns had no authority except to present petitions, complain of grievances and consent to taxes. Their petition when approved by the Lords was sent to the Royal Council, which drew up a decree, and this, when signed, became a law, without any supervision by Parliament over its precise phraseology. Under Henry IV, the statutes were for the first time enacted by the two houses of Parliament. In this reign also the courts decided that a royal order was no justification for a violation of private rights and that the officer obeying the order was personally responsible to the victim and the law.

Between 1413, when Henry IV died, and 1450, the end of the Medieval Period, no noteworthy change was made in the English constitution, the growth of which we have now traced to modern times. The national legislature, comprising two chambers, one of them elected for short terms,

enacted all laws, levied all taxes, and regulated the succession to the throne. This system, gradually developed through the course of two centuries, had a broad basis in the local courts which, brought together the leading landowners and delegates of the minor political districts, compelled them to serve in accusation and trial juries, accustomed them to participate in the election of members of Parliament and in other kinds of shire business, and thus taught them to consult one another and public opinion and to assert their right to be heard in reference to national affairs.

Sec. 61. *English Law.*—The judicial system of England was original and entirely unlike that of either France, Germany, Italy or Spain, each of which was divided into provinces with different laws and independent administrations. In England the uniformity of the law, the subordination of the local to the national tribunals, the presidency of circuit judges in the shire courts, the requirement of a good legal education for the office of judge, the submission of questions of fact to juries, and the participation of the court in electing members of Parliament, assessing, taxing and directing the organization of troops, contributed to make the shire courts not only tribunals for the trial of law suits, but also schools for the political education of the people. The shire courts had more influence than had the cities as centers of political activity, and the leaders of Parliament

for centuries were mostly representatives from the shires, not from the cities.

This judicial system of England had a great influence on the development of civil and criminal law as well as of parliamentary government. Its learned judges contributed much to the uniformity and excellence of the administration of justice. Its juries, with separate bodies for accusation and trial in criminal cases, served to educate the middle class in public affairs. The appeals from the shires to the royal courts, educated the provincial lawyers, and filled them with opinions which found expression in the legislation and administration of the country. The English civil law is original in its forms and in some of its principles, but of these latter, many are copied, without acknowledgment, from the older Roman law, which for several centuries all the judges studied, and many of them applied in their decisions and thus adopted as part of the English jurisprudence.

Sec. 62. *Navigation*.—Notwithstanding the devastation of all the provinces and the destruction of nearly all the cities of the Roman Empire, some industrial improvement made its appearance or spread over more territory in every generation; and even in the Dark Ages—from 600 to 1100,—there were many signs that the future of humanity was to be much brighter than its past.

Navigation made important advances. The magnetic needle, brought from China to Europe

in the IXth century, if not earlier, was long used on a chip of wood in a basin of water, for the purpose of indicating the north when neither the sun nor the polar star was visible. Perhaps two centuries later the needle was mounted on a pivot, and afterward, when placed in a box under glass and over a graduated circle, became the precious mariner's compass. The needle may have been known in the Xth century to the Scandinavians who then crossed the Atlantic, after they had found and settled Iceland. The Teutons were the first to substitute the pivoted rudder for the steering oar and to make the projecting keel as an obstruction to sideward drift. They trusted more to sails than to oars for propulsion, developed the art of rigging, used their ships in winter as well as summer, built vessels specially for ocean fishery and sailed far out in the Atlantic for their finny game. The Basques, who have traditions that their ancestors caught cod at Newfoundland in the XIIth century, were active in the whale fishery and were reputed to be the most skillful pilots and harpooners. Between 1400 and 1490, the Portuguese took the lead in maritime exploration. They discovered Madeira in 1420, the Canaries in 1424, and the Azores in 1431. For more than half a century they strove to find the ocean route to Asia but, unfortunately for them, in this search they persisted in sailing near to the African coast and thus kept in the region of calms, so that they

often gained only a degree or two of latitude in a laborious year; whereas if they had gone out far into the Atlantic at the start and then turned southeastward, they would have met good breezes, and within two months might have reached the Cape of Good Hope, which they did not reach till they had sought it for more than half a century.

In the later medieval centuries, fluvial commerce was much more important relatively, and in many places more important absolutely, than it is now. Then the ungraded, unpaved, muddy, dusty and, in many places, steep roads were beset by robbers or by nobles claiming ruinous tribute from merchandize passing through their domains. A river or estuary two feet deep and forty feet wide was cheaper for freightage and more secure than the average land road; and streams which now have no boats then had many. All the main inland lines of traffic in Europe followed navigable waters as far as possible. Soon after the conquest of Jerusalem by the Crusaders, pepper, cinnamon, other spices and silk were taken from the Black Sea to the North Sea by the Danube and Rhine or Elbe; or from the Mediterranean to the North or Baltic Sea by an Italian and a German river separated only by a portage across the Alps; and payment was made with arms, amber, cordage, pitch, timber and Slav slaves. This traffic did much in the XIIIth and XIVth centuries to build up many German cities. Later than

some of these in getting a start, were the Flemish Ghent, Ypres, Bruges and Antwerp which in 1400 had become a very remarkable cluster of cities to be found within a district eighty miles long and thirty wide. The first two were specially eminent for their manufactures and the last two for their extensive maritime commerce.

Navigable canals were of very ancient date in China, and the report of their importance there may have induced the Italians of the XIIIth century to construct them in the Po basin where their value was much enhanced by the invention of the lock which lifted or lowered the boat from one level to another in a bed of water instead of dragging it up or allowing it to slide down an inclined plane as in China.

Sec. 63. *Cheaper Steel*.—There was a large increase in the stock of steel, one of the most important forms of capital; and the method of producing it from cast iron was discovered. Then furnaces became larger, and the iron foundry had its origin. Axes, adzes, picks and drills were cheaper, heavier and more efficient. The horse-shoe, known but little used in the time of Constantine, became common; and with it the value of the horse for carrying freight increased greatly. The stirrup, an Asiatic invention, brought to Europe by the Huns with the accompanying saddle, added much to the efficiency of cavalry. The horse collar, known to the ancient Romans but

rarely used by them, and its attached harness gave new importance to the cart and wagon with iron trimmings which last had not been used by the ancients because their metal was too dear to be applied to such purposes.

The use of steel and iron in axles, axle-boxes, shafts and gudgeons prevented rapid wear and thus contributed much to the efficiency of the wheel in machinery as well as in transportation. Mills were invented to saw wood and stone, crush ore and sugar-cane, lift forge hammers, work bellows, draw wire and pump water. The transmission of force from one shaft to another by cog wheels suggested to some German, of unknown name and date, a new method of measuring time. By attaching a weight to a cord wound round a drum on a shaft he caused a continuous motion which was regulated by an escapement; and a clock was the result. The face and hands appeared in the XIth century, the town-clock in the XIVth and in the XVth the watch.

The primitive wire made by hammering, was irregular in form and size as well as costly. In the Xth century a German smith of unknown name found that a rod of soft iron or steel could be pulled through a hole in a steel plate, and thus reduced to a small round wire of uniform thickness at very little expense. The product of his ingenuity soon came into extensive use for many purposes, including pins, needles and chain mail.

Sec. 64. *Chimney etc.*—A medieval invention of much importance and of unknown date and place, is the chimney, which rendered a high civilization possible in regions where the mean temperature of January was below thirty-two degrees; and greatly stimulated productive industry in countries where that mean was under forty-five degrees. The cold of mid-winter was considered the greatest discomfort of life by the ancient Greeks, and because of it many days that are now given to labor were then spent idly in rooms filled with smoke or in stables where warmth was obtained from the cattle or from fermenting manure. But for the chimney, the centre of civilization would not have moved from the basin of the Mediterranean to that of the North Sea, and Great Britain, Holland, Scandinavia, Canada and the United States would not be so highly enlightened and so rich as they now are. Window glass, rare in ancient Rome and common among the Italians in the XVth century, like the chimney, contributed much more to the comfort of life and the stimulation of industry in Northern than in Southern Europe. Glass mirrors with backs of tinfoil appeared at Venice in the XIIIth century.

The silk worm, the white mulberry tree on which it feeds, and the art of “reeling” the fibres drawn from the cocoons into a thread of “raw silk” suitable for the loom, were brought from Central Asia to Constantinople in the VIth century, and

slowly made their way westward to Spain, which under Moslem rule, took the lead of Medieval Europe in the elegance of its textile productions; though neither in quantity nor quality nor aggregate value did its annual yield of silk goods approach that of France in our own Era.

Sec. 65. *The North Sea.*—The transfer of the centre of culture from the basin of the Mediterranean to that of the North Sea, one of the most notable changes of the latter part of the Medieval Era, was the effect of many contributing causes. Among these were the maladministration of all the Mohammedan states on the southern and eastern shores of the Mediterranean, the continuous hostility between the Christian and Moslem states resulting from the Papal prohibition of friendly traffic, the consequent continuous naval warfare and piracy in the Mediterranean, the exhausting struggle between the Christians and the Moors in Spain, the discord and weakness of Italy, the desolation of southern France by the persecution of the Albigenses, the destruction of the forests in the basin of the Mediterranean, and the scarcity there of fuel for furnaces and of timber for ships.

While the Latin countries remained relatively stationary the Teutonic regions gained much in power, wealth and intelligence. They drained swamps, cleared forests, brought many new fields into cultivation, took the lead in metallurgy and machinery, educated a large proportion of the

children in many of their cities, and maintained more liberality in their political and ecclesiastical institutions than was common in the southern lands.

For several centuries, after the beginning of the Crusades in 1096, Italy was the richest country of western Christendom. Unlike Germany and France it had got rid of serfdom; and it was enlightened and enriched by the throng of northern pilgrims who visited the shrines made sacred by the traditions that they covered the graves of St. Peter and St. Paul. Most of the warriors from the West on their way to Palestine took ship at Venice, Genoa, Pisa or Amalfi and many of them there purchased armor, weapons and horses as well as food and clothing. Even more profitable than the business of the Crusaders or of the pilgrims was that of the foreign priests who came to Rome for commissions, decrees of papal tribunals, indulgences, red hats, episcopal mitres, abbacies, deaneries, and canonries. The general rule was that the applicant for an office must pay its gross income for a year before he could be installed, and the appointments were given by preference to the aged applicants so that there should be another vacancy in a short time. The money thus obtained was squandered among the cardinals and their families, and through them much of it went to Florence, Genoa and Venice, the first eminent for its manufactures and the last two for their shipping.

Sec. 66. *The Guild.*—The mechanical guild, which first becomes fully known to us in the XIIIth century and then perhaps first obtained complete governmental protection for its privileges, was an association of masters, organized for the advancement of their own pecuniary interests at the expense of other classes. Their rules provided that no artisan should own a shop, hire a journeyman, take a contract or sell a piece of work in the craft unless he were a member of the guild; that no one should be admitted into the guild until he had been elected by a majority vote of its members after he had been a journeyman four years and an apprentice seven years. The number of members was restricted so that there should be a large average supply of work for each shop, and applicants for mastership,—unless sons or sons-in-law of masters, or husbands of masters' widows,—were required to pay admission fees so large, that relatively few could raise the needful money. Strict and complex rules regulated the number of apprentices and journeymen in shops, their obligations to their masters, the requirements of the work done in the guild, the methods in which the work should be inspected, and the charges for inspection,—all these rules being designed to secure the high profits of the masters, and especially of the senior masters, who by the aid of their experience or other influence had obtained control over the junior masters. The

ostensible purposes of the guild were to secure high degrees of mechanical skill and pecuniary responsibility in the masters; its real purposes were to protect them as far as possible against competition, to assist them to obtain extortionate prices for their work, and to enable them to cruelly oppress their subject journeymen and apprentices.

Instead of permitting the master to make anything in his trade as ordered by a customer, the guild rules, in many cases, fixed the shapes and sizes and other conditions of work. The weaver must make his bolt of cloth of the width and length prescribed by the guild and before delivery must have it examined and approved by the guild inspector, who charged a high fee. Many of the regulations in regard to sizes and qualities were preserved and enforced long after the reasons for them were forgotten and when their general influence was injurious to the guild as well as to the general public.

As the privilege of taking contracts for work in the different crafts was limited to the respective guilds, the question often arose whether the job belonged to this or that department. The lines of separation never were and never could be fully defined. If a boot required one half or three fourths of new leather for mending it, should it go to the shoemaker or the cobbler? If a coat required one half or three fourths of new cloth to make it fit for wear, ought the tailor or the mender

have the job? An article of leather might not be part of either saddle or harness, and yet be akin to both, so that the saddler or harness-maker could claim, with equal plausibility, that it belonged to his guild. Similar questions might arise between the joiner and cabinetmaker; between the joiner and the carpenter; between the carpenter and the wheelwright; between the baker and the pastry cook, between the pastry cook and the confectioner, and so on. Law suits between the guilds about their respective limits were numerous and in many cases drawn out through generation after generation with numerous counter-suits, great expense to the litigants and inconvenience to the people, who found difficulty in getting certain kinds of work done.

Sec. 67. *Medieval Sociality.*—The moral condition of a people severely oppressed politically and ecclesiastically, as the medieval Christians generally were, must be low. They could neither obtain an education, nor accumulate property nor secure protection for their rights of person or property. Their lives and all that they had were at the mercy of their noble lords, each of whom was absolute master in his own domain. The bonds of friendship and of family affection among them were greatly weakened by the frequency of devastating wars, famines and pestilences.

The destruction of the cities, schools and libraries, the desolation of the rural districts and the

rise of rude dialects, on the ruins of the polished Greek and Latin languages, implied a great intellectual and moral decline, which was followed by a period of literary and artistic torpidity, known as the Dark Ages, from the obscurity of which Europe emerged slowly. During four or five centuries, the best Schools and the most learned men of their time were to be found in the Moslem cities of Bagdad, Cairo, Cordova and Antioch.

The revival of learning began early in the crusading period. Intercourse with the East was followed in the West by the collection and study of the Greek and Latin classics; by the rise of the universities of Bologna, Padua, Naples, Montpellier, Paris and Oxford; and by the development of the Tuscan, Castilian, Flemish, and early French and English literatures. In all these matters, the laymen were the leaders; the few priests who participated did so in defiance of the feeling dominant in the papal court and among the Catholic priesthood generally.

Education advanced slowly after 1150 A. D. Instruction in all the Universities and high schools in the Christian portions of western Europe was given exclusively in Latin, which required six or eight years of labor to enable the students to read, speak and write it, and when they had learned so much, if not before, the schooling of the majority came to an end. By declaring that Latin was the only proper tongue of scholarship, the priests

threw great obstructions in the way of popular education and vernacular literature. Nearly all the Latin and Teutonic states allowed their children to grow up in gross ignorance, but some Flemish and German cities provided for the education of all the sons of citizens in their vernacular language; and so also did Florence which seems to have commenced this work sooner and to have done it more thoroughly than any of her Teutonic rivals. In the XIIth century her boys generally were familiar with letters, and her people as a body were the most refined of their time. Their education fitted them to maintain an enlightened and liberal government; to patronize literature and art; to produce eminent diplomatists, statesmen, historians, architects, sculptors and poets; to give them the intellectual leadership of Europe for two centuries; to make their dialect the literary language of Italy, and to complete the grammar and vocabulary which it retains to the present day.

Although Italy took the lead, in the revival of learning, in the establishment of universities, in the production of admirable poetical, political and historical compositions, and also in sculpture, painting and music, which last she devised a way to write intelligibly, yet she left the origination and complete development of the grand Gothic architecture to her northern neighbors, the French and Germans.

Sec. 68. *Medieval Review.*—The Medieval Era is distinguished by showing no important improvement in general culture, which in some respects was lower in 1450 than in 300 A. D. Four centuries of frightful collapse, were followed by seven and a half of slow recovery. The adoption of an intolerant religion, and the refusal of the people to defend a government which cruelly persecuted them, led to the destruction of the political authority, the military discipline, the wealth and even the language of the Roman empire. For once priestcraft became a dominating factor in European life, and having swept away the culture and the cities of classic antiquity, it established the most oppressive combination of ecclesiastical and political tyranny known to history.

CHAPTER VII.

THE PRESS ERA.

Section 69. *Indications*.—Although the Press has been used much more extensively since 1750 than before, it is the typical product and the best symbol of the Era which then came to a close; and I have not been able to find any other name so short, so expressive, so convenient, and so easily remembered as the Press Era.

About the middle of the XVth century many signs indicated that Western Europe had reached or was about to enter a new Step of Culture. Numerous changes had recently occurred in each of the main departments of life. New languages, new literatures, new nationalities and new forms of government were taking shape. France had established a strong monarchy; England, had consolidated her provinces and had adopted representation in parliament and in local institutions. Serfdom had disappeared in several countries and in all cities. Maritime enterprise, stimulated by the mariner's compass, was more active than ever before. Metallurgy had been greatly stimulated by gunpowder, artillery, the high furnace, and the waterpower bellows and tilt hammer. Learning

had been fostered by many new universities, by the revival of the study of Greek and Latin literature and by the cheaper books made with linen paper. Engraving, printing ink and block printing were of recent origin. Royal and municipal secretaries and judges were learned men hostile to the Catholic church and ready to favor revolutionary ideas and measures. The rise of the merchants and of the free artisans made a basis for a movement hostile to the medieval alliance of priestcraft with feudalism and serfdom, and signs of ecclesiastical and political emancipation were numerous.

The promises thus made were fulfilled by the Era which began in 1450 and lasted three centuries. It broke the fetters of feudalism and the Papacy in much of Europe. By discovering America, Australia, the ocean route to India, the Pacific Ocean and the circumnavigability of the globe, it enlarged the bounds of the known world. By improving artillery and projectiles and making the musket, flint lock, bayonet and cartridge, it revolutionized the arts of military and naval warfare and gave preponderance to those nations most skillful in the industrial arts. It transferred the leading influence in civilization from the Latin to the Teutonic nations, and from the basin of the Mediterranean to that of the North Sea. It made important developments in the principles of constitutional law. It created new literatures and

literary languages. By the printing press it revolutionized education. It enlarged the domain of science by inventing the telescope, microscope, barometer, and thermometer, by its proofs of planetary gravitation, and by its discoveries of logarithms and the differential calculus. So many great changes in the short space of three centuries indicate the high activity of the modern spirit, and show that the world had fully recovered from the disasters that accompanied the overthrow of the Roman empire.

Sec. 70. *Printing*.—Among the influences prominent in this Era, the most potent was the Printing Press, without the help of which the Reformation and the English Constitution could not have prospered as they did, and without which the discovery of America and the improvements in fire arms might have been long delayed. The term, the press, used comprehensively, means not only the machine by which paper is brought into contact with inked type, but also the alphabetic type of cast metal. This type was indeed the most ingenious and most important part of the invention. Printed books had been common in China for centuries before they were known in Europe; but the Chinaman's simplest type represented a word and as he had thousands of words so he had a great number of different types which, for lack of an alphabet, he could not arrange in a simple set of cases. He preferred therefore to cut

his type in page blocks, which he could easily find. Having no need for many types of one kind, he never adopted the process of casting them. The remarkable difference between the rapid development and great influence of printing in Europe and its stationary condition and relative insignificance in Asia is to be attributed mainly to the fact that in one continent people wrote with words and in the other with letters; in one with hieroglyphics and in the other with an alphabet.

The invention of alphabetic type is claimed by Germany for John Gutenberg and by Holland for Laurence Coster without complete proof for either side, but the preponderance of evidence is in favor of Gutenberg. Holland made the first printer's ink, and printed the first books from engraved blocks in Europe; but alphabetic type of cast metal and the press for bringing the inked type and the paper together were the most important features of the new invention and both these originated, so far as we can now learn, in Germany. Within one generation after metallic type appeared, about 1450, the art of printing spread over much of Europe, greatly cheapened the price of books, gave a strong impulse to learning, stimulated the development of vernacular literature and prepared the way for emancipating Northern Europe from the yoke of Rome. The Medieval copyist spent ten months or three hundred days in copying a Bible, and his work besides being

costly was often inaccurate and not legible without difficulty. The Printing Press has not only made a reduction of more than ninety nine per cent in the cost of fixing letters on paper, but has also made them more uniform, and distinct in pattern, sharper in their lines and smaller in average size, so that its books are more convenient for use. It has also led to the adoption of punctuation, and to a judicious use of capital letters by which the perusal of the text with a prompt understanding of the author's meaning is greatly facilitated. Another advantage of the Press is that it permits the use of unsized paper which would not do for the penman. And finally by leading to careful correction of proofs, it gave to books an accuracy and trustworthiness which they never had before.

Sec. 71. *Columbus.*—The discovery of America, the greatest achievement of maritime enterprise, was undoubtedly hastened by Gutenberg's invention. The narrative of Marco Polo, published early in the XIVth century,—he had been in China from 1277 till 1292,—soon found readers in Italy, Germany, Portugal and Spain, and though generally regarded as untrue in many of its statements, it recalled to scholars the ancient scheme of sailing from Europe westward to Asia. The Greek geographers greatly overestimated the distance from the Mediterranean to the eastern coast of Asia; and underestimated that from western Eu-

rope across the Atlantic to China. Strabo said this latter distance was less than 1000 miles. Seneca predicted that new worlds would be found, and Petrarch (1304-1374) gave expression to a similar idea. The improvement in shipbuilding, the discoveries of Iceland, Madeira, the Canaries, and Azores and the exploration of the coast of Africa south of the equator by the Portuguese, set mariners to thinking about the desirability of sailing across the Atlantic. Globes were made showing the positions of the three continents and their extent from east to west in the north temperate zone, but without definite limits for Europe and Asia in the north or for Africa in the south.

Among the men who gave much attention to the scheme of crossing the Atlantic was Christopher Columbus, a native of Genoa, a mariner and map maker by occupation. In 1475, while residing in Lisbon, he determined to get up an expedition for that purpose if possible. He had visited the Azores and Iceland, and in the latter had perhaps learned about Greenland and the cod-fishery in the Atlantic south of Greenland. Having no means of fitting out a ship, he applied for aid to the King of Portugal and failing with him, turned to Ferdinand and Isabella of Spain who gave him three small vessels in which he sailed from Palos in August 1492 and on the 12th of October in the same year discovered one of the islands of the

West Indies. He made two other voyages across the Atlantic and in 1498 saw the mainland of South America, but died in 1506 supposing that the lands which he reached were portions of Asia or islands near its coast.

The discoveries of Columbus were soon followed by those of Da Gama, who opened the ocean route to Asia, Cabral who found Brazil, and Magellan who crossed the Pacific and proved that ships could sail round the world. Three new continents were thus made known to geographers, and two new oceans (Pacific and Indian) made familiar to European navigators. Maritime commerce increased and marine architecture and the art of navigation improved greatly. The quadrant was invented and it enabled the seaman to find his latitude more readily and more accurately than he could with the astrolabe. New articles of traffic became familiar in the marts of Europe, including spices, silks, rice, tea, cotton yarn and cotton cloth from Asia; gold, silver, diamonds, sugar, indigo, vanilla, chocolate and cochineal from Spanish America, and later tobacco, timber, tar, pitch, turpentine, codfish, whale oil and whalebone from the English colonies. In return for these things, Europe gave arms, ammunition, tools, wool, linen, paper, copper, lead and steel.

Men became conscious of new wants when they found opportunities for new gratifications. The development of mineral resources was accompa-

nied by a large increase in the supply of coin; and the activity of commerce led to the organization of the banks of Holland and England on new principles. The art of coinage, the principles of national credit, and the method of managing state debts were much better mastered than ever before. The East India Companies of England and Holland, and the Hudson Bay Company, the grantees of great monopolies, obtained dominion over vast colonies, and their shares became prominent forms of personal property, and favorite objects of speculation among rich men.

Sec. 72. *Gunpowder*.—The history of the first production of gunpowder is lost. As early as the XIIth century and perhaps much earlier, the Chinese mixed saltpeter and sulphur with charcoal for pyrotechnical purposes, but whether they used this compound in fire arms, or whether they prepared it so that it was strongly explosive is doubtful. Granulated explosive powder, first made—according to a German tradition—in 1304 by Berthold Schwartz, was used soon after that year, in artillery, the patterns and material of which were entirely of European origin. Cannons when first used in European warfare were made of iron bars, bound together with hoops into barrels, and were so rude in pattern that they could not have been designed by men who had profited by generations of experience. The improvements of casting cannons in bronze and iron, of boring them out, of

mounting them on wheels, of giving them trunions (axles), and of supplying them with balls of cast iron, came very slowly, and it was not until after 1450 that gunpowder began to have much influence in warfare.

The demand for artillery increased the size of the furnaces and improved the art of casting iron. The founders learned how to make better combinations of sand and clay in their moulds, and were thus enabled to produce serviceable and cheap cooking utensils of kinds that had previously been of wrought metal. The discovery was made, or became extensively known, that by exposure to high heat continued through several days, cast could be converted into wrought iron, which then became much cheaper and more abundant than ever before.

By making a demand for firearms of many kinds, gunpowder employed and educated large classes of machinists and smiths, and suggested many inventions in tools and machines. By giving military preponderance to superiority of armament, it compelled the richest nations to devote much of their energy to mechanical and metallurgical work, and to maintain arsenals and shipyards that became schools of the useful arts.

The influences of gunpowder were potent in political and social, as well as in industrial relations. By diminishing the time and the value of drill, and increasing the danger of battle for the officers, it

reduced the attractiveness of arms as a profession, weakened the militant spirit, and undermined the foundation of hereditary nobility. Years of drill are required to make a good soldier now, but they are relatively few as compared with those spent by the noble of ancient Sparta or Rome, who expected that a campaign would be part of nearly every year of his active adult life. By increasing the cost and complexity of weapons, and attaching preponderant power to superior skill in the useful arts, gunpowder has given security that the greatest nations shall be the most peaceful, and that no state shall grow rich in the future, as many did in the past, with military plunder. By compelling armies to begin fighting before coming into close-contact, it rendered warfare less destructive to life and taught the combatants to be more merciful. In many battles of antiquity three fourths of the defeated army were slain; within the last two centuries, so large a proportion as one-fourth has rarely fallen.

Though used previously in European warfare for a century and a half, gunpowder did not become important on the battlefield till 1490, when its influence was greatly increased by improved field artillery, and did not drive out the pike and defensive armor until nearly two centuries later, when, with the aid of the bayonet, the paper cartridge and the flint lock, the musket became the only weapon of infantry and the chief arbiter of war.

The small fire-arm,—the gun to be carried by a man,—did not make its appearance until about 1470 when it was a simple iron tube three feet long, with a touch-hole to which a match was applied by hand. The first improvement was a rude wooden stock to enable the soldier to hold the weapon to his shoulder and aim; and the second was a lock holding a match and moving it under the impulse of a spring to the touch-hole. This primitive musket,—the matchlock or arquebus,—was so heavy that the soldier carried a forked pole as a rest for the barrel when he aimed. The process of firing was slow and the course of the bullet wild, so that the weapon did little execution. The flint lock had its origin in Spain about 1525 but did not come into extensive use until several generations later. The bayonet was added by France in 1660, and the paper cartridge,—which trebled the speed of firing,—a little later, and then the quickfiring flint lock musket, fitted by the bayonet for the shock of close contact, superseded the pike and lance for infantry, drove out defensive armor, and thus changed the art of war. Rifling, which gives a lateral rotary motion to the ball and keeps it true to the aim, appeared about 1650, but for more than a century and a half was little used on the battle-field, because it was costly and required more time for loading than the smooth bore musket, and more skill in its management than the average soldier possessed.

The increase in the range of the weapons made many changes in the art of war. The troops took positions farther apart at the beginning of a battle than they did previously, and because of the complicated disposition of artillery, infantry and cavalry, the lines were relatively long, and there was much more opportunity for strategy than in the days of the spear. The battering down of strong walls and the bombardment of cities became common events, and the art of fortification was modified.

While gunpowder increased the importance of strategy, it decreased that of tactics. The soldier with the musket learned his military business quicker than the one with the spear or sword; and because of this difference, no modern state has had or has aspired to have such a military aristocracy as that of Sparta. The immediate contact of the opposing armies fighting with spear or sword, the deadly duel of every man in the front rank with his opponent, the vast importance of strength, activity, skill and the coolness that comes with long experience, and the probability that a large proportion of the soldiers on one side or the other would never leave the field alive, were far more trying to the courage and confidence of men than have been the conditions of battle at any time since 1700. Before the Steel Era two thousand years elapsed without such an improvement in the art of war as is now made once in a century or of-

tener. Then the drill was much more prominent than it is now in war; and then nearly all freemen were, and now relatively few are, soldiers.

The change in the mode of fighting was more sudden and more complete on sea than on land. There cannonading became decisive; and ramming and boarding sank into relative insignificance. Before the days of artillery, warships had low, narrow hulls, and depended for propulsion mainly on oars; the naval vessel of the XVIIth and XVIIIth centuries had high, wide hulls and a vast spread of canvas; and superior sailing capacity, giving the advantages of forcing and avoiding battle, was of vast importance.

Sec. 73. *Agriculture*.—In this Era, agriculture made many advances. Plowshares, hoes and spades of steel, carts, horses, cows, sheep, wheat, barley, rye, oats, maize and potato were introduced into continents where they had been unknown previously. Spices, sugar cane, indigo, rice and tobacco were set out in large plantations to supply distant markets. The art of breeding domestic animals for special purposes by artificial selection was developed or made known publicly for the first time with a considerable increase of profit in herds of sheep, cows, and horses. The weight of the butcher's meat in the average steer and of the fleece produced by the sheep has doubled, and so has the yield of the wheat field under the stimulus of fertilization, drainage, and better ploughing.

Among the plants brought to the basin of the Mediterranean by the Arabs from Hindostan in the Dark Ages was the sugar cane, which they planted in Sicily and Spain, where they made a little sugar, but as the climate was not such as the cane needed for high productiveness, the plant and the sweet crystals made from its sap had little place in the market of Europe, until after plantations of cane cultivated with African slaves were established in the Antilles; and then sugar became a prominent article of European commerce.

Maize and the potato, two of the most prolific, palatable, and nutritious of the plants used for human food, were carried across the Atlantic from America and are now cultivated extensively in other parts of the world. The very large yield of the potato,—more than ten times that of wheat to the acre,—the facility with which it can be cooked, its easy digestibility, and its pleasant neutral flavor fitting it for use with all kinds of meat, render it the most valuable of all the tubers. In extensive regions, maize yields three times more nutriment on an acre than wheat, and not only supplies meal for bread and porridge, but in the green ear is a delicious moist kitchen vegetable, and in the form of hominy may be classed with rice and beans.

Sec. 74. *Knitting*.—We do not know when or where the process of hand knitting was invented, but some of the earliest records of its use suggest

that it originated in Scotland early in the XVth century, though it did not come into extensive use or render much service to mankind till after 1450. It had the important advantages over weaving that it required as material only a small ball of yarn, and two knitting needles, and that the work could be done in the house or in the field by a person while sitting down, standing up, walking, talking or reading. No other kind of productive industry can be taken up or laid aside with less inconvenience, and none offers less obstruction to the flow of conversation or other social entertainment. Its knit garments have some decided advantages over those made of cloth; they are more elastic, they fit the hand, the foot or the body more closely, and are warmer with the same weight of material. During nearly two centuries all stockings were knit by hand, and the knitting machine, invented in England about 1600, did relatively little work until after it was greatly improved two centuries later, and driven by steam.

Sec. 75. *Precious Metals*.—The entire amount of gold and silver in Europe in 1450 is estimated to have been about \$400,000,000, or little more than the world's present annual production of those metals. For a thousand years the stock had been decreasing, because the wear and loss surpassed the additions. By the conquests of Mexico, Peru and Brazil, and the development of their mines a wonderful increase was made in the supply of the

precious metals, the annual yield of which averaged \$17,000,000 in the XVIth century, \$25,000,000 in the XVIIth, and \$35,000,000 in the first half of the XVIIIth. These sums are small as compared with the \$350,000,000 or more in the average year of our time, but were immense as compared with the medieval store; and they contributed greatly to stimulate the enterprise and increase the wealth and power of the countries which obtained them with the least expense—of Spain, Portugal, Italy, France, Germany, Holland and England, while other countries remained almost stationary and were relatively impoverished.

Although the Spanish settlers in Mexico and Peru were probably inferior in some points of culture to the conquered Aztecs and Quichuans, yet possessing steel for drills, hammers and shovels, gunpowder for blasting and mules for transporting and grinding ores, they were better miners, and they greatly increased the production of gold and silver in those countries and improved the methods of reducing the ores as well as of extracting them from the earth.

Sec. 76. *Cabinet Government*.—The most important political event in this Era was England's advance in constitutional government, enabling her to take the lead of all other nations in naval power, maritime commerce and wealth. By consolidating herself with Scotland in the Kingdom of Great Britain, and by planting free colonies

along the eastern shore of North America from the Savannah river to the St. Lawrence she fortified her military and naval position, and laid the foundation for a vast dominion of her language and literature.

Her political development was not continuous; for a time it seemed to have taken a backward course. From 1450 till 1550, and afterwards at intervals until 1689, important guaranties of popular rights were set aside or seriously endangered. All the monarchs of the York, Tudor and Stuart dynasties were unfriendly to parliamentary government, and most of them carried their unfriendliness to the extent of extreme hostility. Henry VIII obtained permission from an obsequious parliament to issue decrees possessing all the authority of law. The bishops of the Anglican Church, established under his supervision, taught that Kings hold absolute power by divine commission. James I declared that "it is atheism and blasphemy to dispute about what God can do; good Christians content themselves with His will revealed in His word. So it is presumption in a subject to dispute what a King can do, or say that a King cannot do this or that." Such assertions of absolute power were not contradicted by any high authority for several generations. Charles I made them the guide of his royal conduct, and paid for his blunder with his head. The successful resistance to his despotic measures, and the

liberal policy and very able administration of Cromwell did much to educate the people in the principles of liberty. The clergy of the national church, then a great power, combined with the nobles generally to sustain the crown, and the rebellion owed its success mainly to the Puritans or dissenting Protestants who thus were the saviors of English constitutional liberty at a critical point of its career.

After spending many years in exile, Charles II was restored to the throne by Parliament, which, in his reign, adopted some important guaranties of civil liberty. In the Habeas Corpus Act it prescribed definite rules for terminating arbitrary imprisonment; in the Purveyance Act it protected the people against plunder by royal officers; and by adopting a system of appropriations for specific purposes and requiring parliamentary examination of the national expenditures it checked great evils. Charles disliked all these reforms, but gave his formal approval to them rather than quarrel with the party to which he owed his crown.

James II, the last royal Stuart, brother of Charles II, and son of Charles I, imitated the example of his father, defied the Parliament, violated some laws, suspended others, showed his purpose of re-establishing Catholicism as the religion of the state, and was driven into exile by a rebellion. William III, who succeeded him, took the crown by Parliamentary grant, to which

were annexed the conditions by "The Bill of Rights" that the monarch should not suspend a law, nor levy a tax, nor keep a standing army, nor deprive the people of arms, nor restrict the right of petition, nor grant a pardon before trial and sentence. Soon afterward Parliament adopted the principle of toleration, and thus terminated a great wrong and a great political folly. A foreigner by birth, tongue, education and association, William III was never a favorite with the English people, and Parliament treated him on several occasions with scant courtesy. In 1702 he was succeeded by his sister-in-law, Queen Anne, a weak sovereign, in whose reign the principle of cabinet government, introduced under her predecessor, was firmly established,—the rule that the administration must be conducted by a committee of Parliament, possessing the confidence of the House of Commons. This system proved highly efficient and flexible, and was a great improvement in representative government. The power of Parliament was increased by an act providing that there must be an election for members of the House of Commons at least once in seven years, and by another providing that certain appointees of the crown should not be eligible to Parliament. The latter act was an improvement on previous legislation, but afterward proved unsatisfactory, because under it one-half of the members of the House of Commons might be public recipients of

the royal bounty. The dignity of the courts was increased, and the constitutional rights of the people were protected by an act providing that high judges should not be subject to removal by the monarch.

Anne was succeeded by George I, who, at the age of fifty-four, went from Hanover to accept the British Crown. He reigned thirteen years without learning the English language or acquiring any control over the government. His son, George II, thirty years of age, when he arrived in England, was a foreigner in spirit and a figure-head in the government till the end of his reign. During three quarters of a century the crown was worn by three kings of foreign birth and one queen, all of whom owed their royal office to Parliament, and were subservient or submissive to it as to a benefactor.

The Teutonic countries of Europe and the English colonies in America having the most liberal governments, the largest proportion of popular education, and the best supply of timber for ship-building, took the lead of the Latin nations in marine architecture, in navigation, and in maritime commerce. From 1600 till 1650 Holland was the mistress of the seas with more ships than all other European nations together, but before 1750, Great Britain had taken the first place in shipping and in naval power.

Sec. 77. *American Colonies*.—The cause of political and civil liberty in England was strengthened by indirect influences from North America where nearly a dozen colonies, established in the XVIIth century, enjoyed high prosperity under democratic charters or constitutions. There, in an extensive region comprising much fertile soil in the temperate zone, a large community of pure Aryan blood grew up living by their agriculture, their ship-building, their fisheries, their timber, and their mechanical arts.

Having carried the principles of their ancestral liberty with them, the English settlers in America established representative government and approximate political equality in all their colonies, not only as protections for their rights, but also as attractions for others whom they had left in the mother country. From their first establishment in the New World, they regarded the immigration of other Englishmen as one of the chief sources of profit for the colonies, adding greatly to the value of their land and of their produce. They bid high for good men and got them. In every one of these colonies, an elective assembly, representing a large proportion of the freemen, levied all colonial taxes, fixed and controlled all salaries,—even those of the governors appointed by the English monarch,—and in New England maintained the systems of town government and of state education, which contributed greatly to the intelligence, strength, and credit of the country.

A notable American institution is the New England town or township which had its origin in Massachusetts soon after the Pilgrim Fathers made their first settlement there. It is a direct democracy in which the voters, assembled in town meeting, elect all the town officers, levy all the taxes, order all the disbursements,—including the proper shares to the county and state treasuries,—and control the governmental business of their territory, which may be as large as a tract ten miles square. Coterminous towns made up a county, as coterminous counties made up a colony. The town was never regarded as a sovereign community; its power was delegated to it by the colony at first, and is now delegated to it by the state. The early settlers of New England were nearly equal to one another in fortune, military efficiency and education, and were not disposed to submit to the control of any one or any few of their number; the democratic town was the natural result of their circumstances. They had never seen a town organized on the plan which they adopted, and no such town had ever existed anywhere. It could not have arisen among, or been maintained by, ignorant men; it required that its voters should be educated; it demanded and it established state schools; and it made the people of early New England the most intelligent of their time.

The principle of religious toleration was adopt-

ed by the government of the United Netherlands as early as 1580. Though the property of the Roman Church was confiscated, and the images in public places were destroyed, Catholics, as a general rule, were not molested for adherence to their old creed. The same tolerant policy was pursued by England, though until 1689, when toleration was established by law public worship and public acts of many kinds indicating heretical or schismatic opinions were frequently punished with great severity. After 1720, the laws against heretical belief were not enforced in France nor in most of the German countries. In Spain, Portugal, their colonies and in Rome, the inquisition was maintained, and many persons were imprisoned and tortured every year. The first explicit legal declaration of the principle of toleration was adopted in 1647 by Rhode Island, which announced that in its jurisdiction "all men may walk as their conscience persuades them." Two years later, the Catholics of Maryland, while in great fear of Cromwell, adopted an act proclaiming the principles of religious liberty in their territory. Their recognition of the rights of conscience was given under duress; its principle was never commended by papal authority.

Sec. 78. *Continental Europe.*—In this Era the monarchy of France absorbed much territory previously attached loosely to its crown, and added much to the royal power of defending the nobles

of their feudal jurisdictions, but it failed to consolidate its provinces, and to establish a uniform system of civil and criminal law for all its subjects. Having neglected to maintain its medieval representative institutions, it sank into despotism. Yet it was more compact, more harmonious, more peaceful, more powerful, more wealthy and more prosperous than Germany, Spain, or Poland, the other largest civilized Christian nations of Europe. Russia was then accounted barbarous.

Between 1450 and 1600, Christian Spain conquered Granada, placed its sovereign on the imperial throne of Germany, obtained dominion over Naples and Sicily, subjugated considerable portions of North and South America, annexed Portugal, and held a monopoly of the ocean traffic with the East and West Indies. A dominion so extensive, an ocean traffic so extensive, and a tribute of precious metals so large had never before belonged to any nation. Yet this most brilliant success was soon followed by a series of most wonderful disasters. The Spanish monarchs undertook an extensive warfare against human nature. They persecuted the Moors, the Moriscoes, the Jews and the Protestants in Spain; they tried to destroy the principles of the Reformation in Flanders, France, Germany and England; they failed nearly everywhere, and they succeeded in diminishing the population of their country from 14,000,000 to 7,000,000.

One result of the warfare against Protestantism by Spain was the rise of the republic of Holland, which for more than a century took the lead of the world in maritime commerce and ocean fishery; but about 1700 begun to decline rapidly in her relative international position because her territorial basis in Europe was too small to enable her to compete on equal terms with Great Britain.

In population and military power, in the number of her cities, in the skill of her mechanics, and in the general intelligence of her people, Germany was the first among the European nations at the close of the Medieval Era. She was then more compact politically than France or Spain, but unlike them, she did not succeed in consolidating herself, and by the persecuting warfare accompanying the Reformation she was divided, impoverished and reduced to relative insignificance in political and literary relations.

A notable feature of this Era was the great relative decline of Turkey in military ambition and power. For more than two centuries she tried to conquer Christendom, and the western powers feared she would succeed. She acquired extensive possessions in Central Europe, and more than once besieged Vienna, the last time in 1683. Before 1730 she had been so completely beaten that she abandoned the hope of extending her dominion. The conjunction of several events contributed to reduce her revenue and weaken her army.

Her income was diminished by the transfer of the trade between Europe and Asia to the ocean route. Her relative wealth and power were reduced by the flood of precious metals pouring into the treasuries of the Christian powers from their colonies in the East and West Indies. Her armies suffered many disastrous defeats because they did not promptly adopt the bayonet, the cartridge, the flint lock and the light field artillery. She made no improvement in her highly defective administration while her most formidable enemies, Russia and Austria, were making many in theirs. Like her religion, she had passed the zenith of her career.

Sec. 79. *Slavery*.—Before 1750, slavery was lawful and reputable throughout Christendom. It was not prohibited by any state nor condemned by any church. When Portuguese explorers reached the coasts of Africa where negroes were abundant, they received a written permit from the Pope to subject the black people to slavery; and this document was supposed to apply equally to the redmen enslaved in the West Indies, Mexico, Brazil and Spanish South America. If the Indians of New England and Virginia could have been held in bondage with profit, they would not have been allowed to maintain their freedom. In the West Indies the bondage was most cruel and destructive; within twenty-five years the aboriginal population, estimated to number more than

10,000,000, was exterminated. There are no means of ascertaining now how many of these died in war or how many under the exhaustion of excessive labor.

In Mexico and Peru the Spaniards enslaved the aborigines and treated them so cruelly that there was a very rapid decrease in the population, so rapid that many Spaniards in Mexico predicted that within a century the Aztecs would disappear as the natives of the Antilles had disappeared. The able and angry protests of such men as Las Casas and Zurita attracted much attention in Madrid and Rome, and on the 9th of June, 1537, Pope Paul III issued an apostolic or encyclical letter in which he declared that the American aborigines were rational beings, that they were capable of becoming true Christians,—many of the Spanish oppressors asserted the contrary propositions,—and that it was a mortal sin to hold them in bondage. The Spanish King accepted the principles of this letter, and ordered the emancipation of all the aborigines in his American dominions.

For more than thirty years before this letter was written the slave trade between Africa and the Spanish colonies in the West Indies had been active and notorious. It was authorized and legalized by a royal license; it was approved directly or indirectly by most of the Catholic priests in the New World, many of whom bought negroes and kept them in bondage. Of this trade and compul-

sory service Paul III said not a word; and his silence, in reference to these points, implied that the negroes were not rational beings, could not become true Christians, and were not entitled to the same rights as aboriginal Americans.

Sec. 80. *Modern Literature*.—In the three centuries between 1450 and 1750 the intellect of Western Europe was stimulated greatly by the multiplication of books, the reduction of their cost, the development of vernacular literature, the emancipation of many countries from Papal bondage, the extensive recognition of private judgment as the highest authority in religion, the common study of the Bible, and the vast increase of knowledge in geography, astronomy and many branches of industry. Character was developed by free inquiry and its accompanying self-reliance. The household circle was made more attractive by the habit of reading; by the additions of the chimney, the glass window and the wooden floor to the dwelling; by giving a plate, cup and saucer of earthenware, a knife, fork, napkin and a chair (as a substitute for a bench) to every person at meals in the houses of all except the very poor; and by adding sugar, tea, coffee, chocolate and rice to the articles of food. Woman's work was facilitated and her toil made more efficient by supplying her with the spinning wheel, the sewing and knitting needles, the thimble and the rivet scissors. The opera, the concert, the evening party for dancing

or conversation, the state reception open to ladies, and the theatre, with actresses as well as actors, were new features of social life, and their influence in the aggregate was profound. Music was enriched by the Italian invention of the violin about 1480, and the piano about 1720,—the two most important of all musical instruments—and also by the improved orchestration of John Sebastian Bach, who contributed much to give to Germany, his native country, its musical pre-eminence.

The maritime discoveries of the XVth and XVIth centuries led to transmarine migrations unlike any witnessed in earlier times. Spain, England, France and Holland each had its possessions in America or the East Indies, to which it sent many of its young men as civil officials, soldiers, merchants, mechanics or agriculturists and, by giving them wide experience in new positions of high responsibility, with liberal pay, stimulated the ambition of those who remained at home.

The literary languages of Germany, France and England took their present shapes in the XVIth century, and in their development were greatly influenced by the Protestant Bibles, sermons, hymns and catechisms, which were then more read than any other books. Luther, Calvin and Tyndale became the models of correctness in the meaning of words and the formation of sentences in their respective tongues. Stimulated by the

prosperity and confidence following the defeat of the Spanish Armada in 1588, English literature leaped to a high place in the plays of Shakespeare, which are unequalled in their dramatic effect and not surpassed in poetic merit. Because of impoverishment by warfare and bad government, Germany contributed relatively little of note to art or literature between 1550 and 1750.

About 1630 France took the intellectual leadership of Europe and retained it for four or five generations with a multitude of poets, historians, orators, essayists, scientists, sculptors, architects and painters. She elevated her capital to a metropolitan position in the literature of Europe; she made her tongue the common speech of diplomatists and scholars. The Spanish peninsula produced much excellent poetry and one great prose romance,—*Don Quixote*,—but after 1650 fell into a literary lethargy.

Among all the books written in this Era, the one that exerted the most influence on governmental action was the treatise of Hugo Grotius, a Hollander, on the Laws of War and Peace. It appeared at a time when the recent increase of wealth, education and national power in Western Europe had prepared statesmen and lawyers to appreciate the first able, learned and comprehensive treatise on international law.

The name of Galileo Galilei is one of the most glorious in the records of science. He was a pro-

fessor in the University of Padua in 1608 when he heard that distant objects had been seen with wonderful distinctness through two lenses fixed in a frame by a Dutch optician. Under the stimulation of this report, he made experiments, and obtaining encouraging results, he fixed a lens in each of two tubes, one sliding in the other, so that the focus was easily adjustable. Thus, in 1610 he invented the telescope, which enabled him to discover the moons of Jupiter, the phases of Venus, and the spots of the sun, and by these discoveries, to prove that the earth revolves round the sun and rotates on its axis, that the sun rotates; and that the universe is vastly more extensive than had been supposed previously. He also made a microscope and a rude thermometer, and discovered some of the most important laws of motion. He not only gave a great impulse to scientific investigation, but by his telescope he rendered great service to navigation and surveying. One of his pupils, Torricelli, discovered the weight of the atmosphere, invented the barometer, and explained the principles of the suction pump. Between 1450 and 1650, Italy was prolific in eminent authors and artists, but after Galileo had been persecuted by the Inquisition she sank to a low place in scholarship and remained there until the influence of the Papacy had been greatly diminished.

John Kepler, a German, discovered three of the important laws of our solar system,—those of the

elliptical forms of the planetary orbits, the proportionate distances of the planets from the sun, and the relative speed of the planets in different parts of their orbits. He showed wonderful acuteness of observation and soundness of judgment in conceiving and proving these laws which gave to astronomy a much higher dignity than it had previously. Even more wonderful was the genius shown by Isaac Newton, who discovered and proved that the motions of the planets are governed by the law of gravitation, thus overthrowing the error that supernatural power was constantly exercised to keep the planets in their places. He first observed the different degrees of refraction in the parts of the spectrum. He also discovered the theory of fluxions—a branch of the differential calculus which is regarded, by eminent scholars, as one of the most difficult achievements of thought,—invented the reflecting telescope, and suggested all the main features of the quadrant. Notwithstanding his remarkable learning and genius, his great services to science and his intense zeal for Christianity as he understood it, he was denounced by rival astronomers as being an atheist in disguise. Leibnitz, as translated by Draper, said Newton “robbed the Deity of some of His most excellent attributes” and “sapped the foundation of natural religion.”

Sec. 81. *Ornamental Art.*—The increase of wealth in Italy, and especially in Rome and Florence, led

to great activity in painting. Numerous churches and palaces were adorned with large frescoes, intended to be seen from a distance. The chief merits of these works were a grand conception, an appropriate design and a strong effect of color. As the pigments were all applied while the plaster was fresh, and the requisite moisture did not last more than a few hours, the artist could not re-touch the tints nor elaborate the modeling. Fresco painting then attained an excellence which it has never equalled since. Oil painting, discovered in the XVth century, became a new and highly important branch of the pictorial art, and was carried to high excellence in Flanders, where it originated, and also in Italy, Spain and France. Sculpture had its share in the revival of the ornamental arts; and Italy produced numerous statues that, though unequal to those of the ancient Greeks, deserve and receive much admiration.

The general character of architecture changed in this Era. New castles and cathedrals became relatively rare as the wealth of the nobility and clergy diminished; and national buildings and private dwellings in cities became more numerous and elegant than before. Many streets in London, Paris, Amsterdam and Rotterdam showed by their residences that the merchants and bankers were rising as classes into a prominence previously unknown. Although the churches of St. Peter in Rome and St. Paul in London were the most

imposing architectural products of this Era, they were not so typical of its character as were the royal palaces and the buildings of the national banks in England, France and Holland.

Sec. 82. *Social Condition.*—The general condition of the majority of Europeans had been improving for many centuries, yet it was miserable in 1750. They were serfs and, with rare exceptions, had no hope of obtaining freedom, or education or escaping from extreme poverty. They did not increase two per cent in a generation; because of the frequent famines, pestilences, and destructive wars, their deaths were almost as numerous as the births. Their homes were single room hovels, with floor of earth, roof of thatch, and no light in the day except that admitted by the door, and none at night except that of an open oil lamp or a fire on the hearth. Their clothing sometimes of leather was usually of coarse linen or wool, and because of the dearness of soap, was seldom washed.

Attached to the dwelling and under the same roof was in many cases a stable for several oxen and a cow, with places for hay and manure. In the summer the hay and in the winter the warmer manure served as a sleeping place for the family. Because of the filthiness of the persons, clothing, bedding and dwellings, parasitic insects and skin diseases, including itch, were common. Scurvy was frequent on land as well as sea, because in the winter the people generally ate no meat except that which had been salted down in October.

In England where all the poor were free, and exempt from feudal services, and more prosperous than in Continental Europe, the peasants were subject to many forms of oppression. They could not change their residence freely, nor fix the prices or hours of their work, nor apprentice their sons to mechanics, nor dress like the gentry, nor speak to the gentry as equals, nor refuse to take their wages in the customary barter, nor obtain redress if arbitrarily impressed to serve in the navy, nor effectively demand release if imprisoned many years for a petty debt. The law provided that capital punishment might be inflicted for a hundred different offenses; and many of the minor punishments including the stocks, the pillory and the lash were regarded as amusements by a brutal populace who pelted the unfortunate offender with mud or clods while he stood with his ear nailed to a post or with his neck fastened in a hole between two heavy blocks.

The title of "The Good Old Times" given by ignorant tradition to imaginary centuries in the past, does not suggest a correct idea of the condition of the majority of the people in the most advanced communities of the Seventh Era, nor of the Sixth, Fifth, Fourth, Third, Second or First. The older the times, the more distant from our day, the harder and more cruel they were in most cases for the great multitude of mankind.

Sec. 83. *Modern Religion*.—Ecclesiastical changes were numerous and great in the three centuries that followed the invention of the printing press. The greed, corruption and cruelty of the Roman Church culminated, and priesthood, as a factor of culture, began to collapse. The Spanish Inquisition, the most malignant institution that ever existed among men, was established in 1485 and maintained through four centuries. The sale of indulgences or licenses to sin was carried on to a greater extent than ever before. Germany was devastated and deprived of more than half of her population by the thirty years' war, undertaken and continued by the Catholics for the purposes of exterminating the Protestants. France was greatly weakened by the persecution of the Huguenots. Southern Flanders was impoverished by the fury and folly of the Spanish Catholics. The clergy of Western Europe, Catholic and Protestant, attacked scientific truth and political liberty with sacerdotal frenzy. They declared that Copernicus, Galileo, Kepler and Newton were enemies of religion, and that kings have a "right divine to govern wrong."

Sec. 84. *The Inquisition*.—The Papal Inquisition was a special sacerdotal tribunal organized for the purposes of searching out and stamping out heretical opinions with the highest possible degrees of zeal and power. The experience of two centuries had shown that the bishops, to whom this task had

been entrusted; were inefficient. These ecclesiastical magnates were nobles, relatives of owners of large estates, and anxious to preserve peace and prosperity in their dioceses. Knowing the desolation that in many cases had followed persecution, they would not be responsible for it; and many of them were easy-going men of pleasure who would not undertake the hard work of managing a heresy court. Some of them discovered that the heretics would pay more money for peace, than they would contribute in fees if they became orthodox. For such reasons the bishops generally disregarded the persecuting orders issued in Rome. Finding that dissent would never be crushed out by episcopal authority, the popes established special tribunals, each under the presidency of a member of the monkish clergy, usually a Dominican, holding a special papal commission. This chief judge must be a priest; a secular lawyer could not decide a question of faith without sacrilege. Spain and Portugal and some Italian cities permitted the establishment of such tribunals; England, France, Germany, Naples and Venice would not tolerate them.

It was the duty of the chief Inquisitor to arrest, imprison and try all persons credibly accused of heresy, to condemn the impenitent guilty to death by fire, to see that the penalty was inflicted by the civil authorities, to direct and preside over the ceremonies at the execution, and to make this "act

of faith," as it was called, a brilliant show, so that it would attract a great number of spectators. If the civil authorities refused to inflict the punishment, they were declared schismatics or heretics and if possible deprived of their offices.

The rules prescribed for the guidance of inquisitors gave credibility to anonymous accusation of heresy. The person thus designated was not protected by any of the guaranties against malicious prosecution provided in the criminal legislation of enlightened nations. He was not entitled to bail, nor to a speedy hearing, nor to a public trial, nor to the aid of a lawyer, nor to knowledge of the testimony against him, nor to confrontation with the adverse witnesses, nor even to the communication of their names. He might be tortured to compel him to confess; and the instruments of torture were part of the furniture of every inquisitorial tribunal. If no evidence could be obtained against him, he was not entitled to a verdict of acquittal, for that would imply that he had been arrested ignorantly or maliciously, and besides it would be a bar to a later prosecution. The judges were stimulated to render verdicts of guilty by a promise of a share in the victim's estate. The accusing witness also obtained a share of the plunder, and thus the malignity of informers and perjurors was aroused and rewarded.

This institution was not restricted to a brief existence or a small territory, but was maintained

for three centuries in all the Spanish, Portuguese and Papal dominions. It burned more than 50,000 persons to death, inflicted lighter punishment on 200,000 others, and pronounced sentence of death on 2,000,000 whom it could not catch. In the city of Rome it burned a score of men, including Giordano Bruno, to whom a bronze monument has been erected at the spot of his torture and execution.

The Inquisition was a sacerdotal tribunal, governed in its procedure by papal law, and authorized to try no offenses except those of an ecclesiastical character. Its judgment was always rendered by a priest holding his commission directly or indirectly from the pope. Heresy was an offense over which civil officials had no jurisdiction, and for that reason the inquisitorial courts never could be considered state tribunals, though state officers might sit with the priest inquisitor to see that the rights of the sovereign did not suffer by the method in which the trials were conducted and the confiscated property applied.

In the large cities of Spain and Portugal, the burnings of heretics by order of the Inquisition were treated as grand public festivals. The people were invited to attend by solemn public proclamation. The site was a large open space,—called a quemadero or burning place in Spanish,—with high stakes to which the victims were tied so that they could be seen by many thousands

of spectators. A platform was erected for the accommodation of the King or his highest deputy in the province, the nobility and the clergy. These dignitaries, the zealous papist and the people who wanted to gain the favor of the priests, marched in a procession from the Cathedral to the place of execution. After the attendants had reached the places set apart for them, a sermon on the duty of extirpating heresy was delivered and the highest political official present,—the King himself if there,—took a public oath that he would do his utmost to destroy heresy in the territory under his control.

Unless the heretic convicted by the Inquisition recanted or died before the time set for his execution, he was burned to death. Rome had no mercy for his offense. No case of pardon is recorded in history. The punishment was never by decapitation, shooting or hanging. The orders for arrest, imprisonment, trial and torture were issued by the sacerdotal authority and the imprisonments and trials were held in the ecclesiastical buildings. All the proceedings had their legal basis in the decree of the General Council of 1215, drawn up and published by Pope Innocent III. "The Church abhors blood," if the assertion of its apologists be true; but if history can be trusted, it delighted in the torture of death by fire.

Of all the gross cruelties practiced by governmental order, those of the Papal Inquisition are

the most odious because the most systematic, the most numerous, the most sanctimonious, the most injurious to the public welfare, and the most offensive to considerable portions of the communities in which they were committed. The Inquisition was an unpopular institution everywhere; in many cities, the people resisted its introduction; in none, did they demand it; in many when they obtained the power, as in insurrections, their first act was to liberate the victims imprisoned for ecclesiastical offenses in the dungeons of the priests. The pretense that the inquisition protected heretics against the vengeance of the rabble has no support in history unless in some very rare exceptions, and then the popular indignation was provoked mainly by something not heretical. The Inquisition was detested by the multitude, and whenever a revolution or a serious riot broke out in a city where it was established, its office was plundered, its priests driven out and beaten if not slain, and its prisoners liberated with advice to hurry away to a place of safety. Such scenes often occurred in Italian cities and especially in Rome.

The rack was found in the secular as well as in the ecclesiastical courts of Continental Europe in this Era, but was less used there, and rarely except when some true crime (which heresy was not) had been committed, and when the presumption of guilt was strong, or the proof conclusive and when

the motive of the application was to obtain information about accomplices. The Protestants were not free from the wickedness of persecuting heretics, but their offenses in this matter were relatively few and small; they had no institution established for the special purpose of hunting up and destroying heresy.

The tortures inflicted by the Inquisition on persons accused of heresy, suggest those inflicted by the Iroquois and other North American savages on their captives taken in war; and in comparison the acts of these Indians show less moral obliquity because they were the acts of a lower culturestep; the victims and spectators were fewer; the suffering at the stake was briefer; it was not inflicted under the plea of saving souls; and the spectacle had a useful purpose, that of teaching the lesson that death in battle was better than captivity.

Sec. 85. *Indulgences*.—In the first quarter of the XVIth century, the Teutonic countries were ripe for a revolt against Rome. The printing press had been at work for two generations cheapening books and stimulating education. The spread of learning had enabled many scholars to see that the discipline and much of the creed of the Papacy had no foundation in the New Testament. The people and princes were indignant at the drain of money to Italy, at the shameless sale of church offices, at the insolent interference of the priests in secular affairs, at the excommunications and

interdicts, at the notorious corruptions of the ecclesiastical courts, at the gross immoralities of monks and priests, and at the reservation of all the highest honors and incomes of sacerdotal office for the Italians.

The Reformation began in the most enlightened part of Europe, Germany (then including Flanders) which had the largest numbers of people able to read, of skilful artisans, of intelligent merchants, of sea-going ships, and of prosperous cities. In 1517 the Dominican monk Tetzel went into Saxony selling printed indulgences, certifying that the purchasers, had been absolved, no matter what their offenses had been; their sinlessness, the same as that which they had immediately after their infantile baptism, was restored to them "as soon as the money rattled in the box."

One of these papers was taken to Martin Luther, professor of theology in the University of Wittenberg, who denounced it as a fraud. He preached sermons to prove that salvation was not a salable commodity; that it was to be gained by repentance and faith, not by money. He was a master of his subject and his objections to Tetzel's indulgences were incontrovertible. Papal apologists replied to him truly that according to high authorities, indulgences were releases from ecclesiastical penances, not licenses to commit sin; but they studiously misrepresented the facts. The main question raised by Luther was not whether the Church had

conclusively defined the doctrine of indulgences, but whether Tetzel's certificate could be sustained by scriptural authority. This paper purported to give to the buyer "that innocence and purity which thou hadst at baptism, so that when thou shalt die, the gates of punishment shall be shut and the gates of the paradise of delight shall be open." Another indulgence, not sold by Tetzel however, purported to be an immediate pardon "for all sins, past, present and future, no matter how enormous." The popes had granted habitually to crusaders general absolution for all sins that they might commit while fighting for the cause of Christ in Palestine. The meaning of the term indulgence had never been defined by a general council; nor had the form of the certificate, in which it was granted, been prescribed by a decree of a council or a bull of a pope. The contractors, who obtained the papal grants for the sales, were usually allowed to draw up their own forms without supervision, and they preferred the phrasology most pleasing to the sinners.

Sec. 86. *Luther*.—Encouraged by the German people and protected by the ruling prince of Saxony, Luther did not restrict his revolutionary teaching to the question of indulgences, but attacked the papal system in many points of doctrine and discipline, with arguments remarkable for breadth of learning and power of expression. He appealed to the Bible as the only guide of the

true Christian; and he translated it, and made his version not only a household treasure of the German people, but did much with it to fix the literary form of his mother tongue. He converted the majority of the German people and broke the back of the papacy. The Reformation did not triumph by the power of argument exclusively. The educated as well as the ignorant man is, as a rule, unable to weigh complicated and conflicting evidences accurately and is rarely convinced by proof. He usually adheres to his old opinion until he is swept along by contact with superior minds, or until his pecuniary interests, his prejudices or his passions impel him to change his position. The Germans loved and followed Luther mainly because they hated Rome. Although he gained great favor with the people and princes of Germany, he would have died at the stake if the foreign relations of the empire had not been propitious to him. During thirty years Charles V had all that he could do in defending himself against the French and the Turks, and as he had urgent need of the aid of all his subjects, he could not venture to declare war against Protestantism. Neither could the King of France extirpate it in his country for the alliance of the Lutheran princes was of extreme importance to him. He and Charles would have been delighted by the destruction of Calvinistic Geneva, but neither dared to do it himself or allow

anybody else to do it. Their bitter hostility to each other gave the Reformation an opportunity to obtain a secure foothold in continental Europe.

Local influences rendered England hostile to the Papacy. In 1528, Henry VIII applied to the Pope for a decree to annul his marriage with his Spanish wife, Catherine, who having been the wife of his elder brother, had obtained a papal dispensation to permit her to marry her younger brother-in-law. Henry, after growing tired of her, said the dispensation had been issued under the influence of misrepresentation; and the pope would undoubtedly have granted a decree of annulment if Catherine had not been the sister of the Emperor Charles V, who was much more powerful than the English King to help and hurt the Church. Pope Clement VII, a false and base man, would not decide the case, but demanded new evidences and new arguments until Henry lost his patience, obtained a decree of divorce from an English Court, married a Calvinistic wife, and became a bitter enemy of the papal authority.

Sec. 87. *Protestantism.*—The main teachings of Luther were that salvation is obtained by faith without sacerdotal mediation, that neither the supremacy of Rome nor the apostolic succession is taught in the New Testament, and that the vernacular Bible should be given to the people, who should be encouraged to interpret it for themselves. In 1530 his doctrines were presented to

the world in the Augsburg Confession, a clearer, more logical and more comprehensive statement of Christian faith than any previously published. It contained many ideas which had never been accepted nor condemned by the Roman Church, and which according to the opinions then prevalent among theologians, must remain doubtful to Catholics until they should be adopted or rejected by a general council. Such a body met at Trent in 1545, but did not finish its work until 1563, and not until after that year was a complete Catholic creed published. Among the new points of doctrine then authoritatively imposed on the Roman Church for the first time, were the list of sacred books, the number and explanation of the sacraments, the nature of indulgences, the dependence of mankind on sacerdotal mediation for salvation, and the equality of tradition with scripture as a basis of faith.

During half a century after its origin Protestantism made rapid progress, and at the end of that time was the faith of perhaps two thirds of the people in England, Flanders, Northern Germany and Scandinavia; of half in Southern Germany, Hungary, Bohemia and Switzerland; and of one third in France and Poland. About 1565, its territorial advance in Europe ceased, and a reverse movement began. This Counter-Reformation as it has been called, owed most of its strength to the opinion that the new doctrines were danger-

ous to monarchical power; for this reason the Southern princes without exception persecuted Protestantism; some with confiscation and banishment and others with fire and sword, until relatively little of it was to be found outside of Great Britain, Holland, Scandinavia, Switzerland and North Germany.

Although the zealous Catholics bitterly hate the memory of Luther, they are under great obligation to him for forcing them to compile their creed and catechism in clear and comprehensive terms, to educate and strictly discipline their secular clergy, to correct their monastic fraternities and sisterhoods, and to abandon their excommunications and interdicts, their royal depositions and their forged laws and land grants. He established Protestantism and reformed Catholicism.

Sec. 88. *Dragonnaire*.—The kings of France denied the solicitations of the popes for the establishment of the Inquisition in that country, but they allowed the bishops to arrest, imprison, torture, condemn and burn hundreds and perhaps thousands of heretics. From 1540 until 1715 all the rulers of the country permitted, and most of them urged ecclesiastical persecution. On the night of the 24th of August, 1572, by order of King Charles IX, a large number of Huguenots were surprised and slaughtered in Paris, and royal orders were sent by special messengers to the provinces instructing local officials to follow

the example of the capital. The number of victims in this massacre was never ascertained; it has been variously estimated from 20,000 to 100,000. Sully, who was Prime Minister under Henry IV, and is the most trustworthy among the authorities, says 70,000. This outrage was commended by Gregory XIII then pope, by whose order it was honored with a medal and with a large picture in the Vatican.

Yet more malignant, and more damaging to the credit and prosperity of France than this massacre of St. Bartholomew, was the Dragonnade ordered by Louis XIV in 1685. Dragoons from the most bigotted Catholic provinces, the rudest and coarsest men in the French army, were quartered in the houses of the Huguenots with instructions that they should make themselves comfortable without regard for the feelings of their hosts, to whom they might offer any insult in speech and gesture, but without robbery or gross personal violence. The officers were informed that the purpose was to make converts and that they would gain no favor at court by trying to protect the heretics. The soldiers and officers did not disappoint the King; after a few weeks and in many cases after a single day's experience with their military guests, the Huguenots rushed to the Catholic priests of their respective parishes, declared themselves converts to Rome and obtained certificates which led to the prompt withdrawal

of the troops. But many of the conversions thus made were not permanent; 500,000 of the new Catholics, though forbidden to leave the Kingdom, succeeded in getting away and carried with them their industrial skill, their energy, their education and their hatred of Rome. By their migration they impoverished France and enriched Holland, England and Prussia.

Sec. 89. *The Jesuits*.—Before 1540, it became evident to intelligent men that as scholars, preachers and authors, the Lutheran and Calvinist pastors were far superior to the Catholic priests; and that Rome must have better seminaries for its clergy. The wisest plan for supplying the want was proposed by Ignatius Loyola, and he soon gained the papal approval and assistance. The first object of his association was to prepare men for the sacerdotal office; the second was to educate the sons of noble and rich parents, and while educating them, obtain a lifelong influence over them; the third was to gain power over powerful and wealthy people by becoming their confessors; and the fourth was to do missionary work among heathens and heretics. They gave no instruction in the primary branches, established no schools for the education of the poor, and as a rule taught no boys gratuitously except such as they hoped to keep in their service for life.

Loyola divided the members of his corporation into four ranks, and to the highest men of superior

ability and learning, were given all the full professorships and the influential offices. The administration was directed by a general holding office for life. Very soon after its organization, the Jesuit society was recognized as a much more efficient aid to the Papacy than either the Dominican, Franciscan or Benedictine order; but soon it began to offend the other clergy by treating them haughtily, trespassing on their spheres of labor, taking away much of their revenue, laying down new rules for the confessional, and facilitating absolution for those who had money. The rules adopted by the followers of Loyola for use in the confessional were exposed to public scorn in the unanswerable Provincial Letters of Pascal; and then the words jesuitism and jesuitical or their equivalents were adopted in all the tongues of Christian nations to express ideas of sacerdotal duplicity.

Sec. 90. *Press Era Review.*—This Era brought many great changes into human life. Its Press placed learning within reach of the multitude and greatly increased the power of those nations which had the most liberal governments. The musket and artillery diminished the value of military drill, and gave superiority in warfare to the rich nations. Great geographical discoveries increased the wealth and the power of the sea-faring states which, because of the character of their business, have ever been hostile to despotism. Priestcraft,

after having usurped control of Religion in the Middle Ages, and then claimed to be its most important part, was weakened and discredited. Thus, in this Seventh Era, Industry, Polity and Sociality (or education) appear to be the chief factors of progress, mutually strengthening one another, while Religion, as inherited from the preceding period, was greatly damaged by the influence of Sociality and Polity.

CHAPTER VIII.

THE STEAM ERA.

Section 91. *Great Changes.*—Events, important in the history of culture, occurred near the middle of the XVIIIth century, and among them were the production of cheaper iron in the coke-burning furnace, and of cheaper steel by Huntsman's process, the inventions of the chronometer and various forms of textile machines, Franklin's electrical and Black's chemical researches, Hunter's contributions to anatomy and surgery, the botanical nomenclature of Linnaeus, the reform of the university system in Germany, the teachings of Turgot and Adam Smith in national economy, the revolt of the scholars in Latin countries against the Papacy, and the great development of military power in Prussia and of naval power in England. These were signs that a new era of culture had begun or was near at hand.

Sec. 92. *Watt.*—The double-acting steam engine, the typical product of the Era in which we live, was patented in 1769 by James Watt, a Scotch mechanic, who had spent four years in improving the rude Newcomen engine that had been used

for half a century in pumping water from mines. By using steam in both ends of the cylinder and by connecting the piston-rod directly with the machinery to be driven, he obtained power from every movement. By condensing the steam in a separate chamber, he kept the cylinder hot and thus saved three fourths of the fuel. By increasing the number of strokes from ten to a hundred in a minute he gained a tenfold increase of working force. His fly-wheel gave steadiness to the movement, and his fly-ball governor automatically regulated the supply of steam. His parallel motion and his cross-head and guides gave a straight push and pull from the end of a lever moving in the arc of a circle. His guage to show the height of the water in the boiler, and his indicator to record the pressure in the boiler, were other original and valuable improvements which contributed to make his engine a wonder of mechanical ingenuity and of practical efficiency.

Watt continued to improve his engine for twenty years and though when he had completed his work, it was the most wonderful product of inventive genius, yet hundreds of improvements have been added by later mechanics, as if it were susceptible of infinite development. It associated itself with many different branches of industry, and became a large factor in the production of wealth, the development of national power and the accumulation and dissemination of knowledge.

Sec. 93. Steamboat.—The project of a steamboat was the study of many men and the subject of many experiments during more than a quarter of a century before Robert Fulton's "Clermont" built at New York became a success in 1807. She ran seven miles an hour, carrying passengers and freight profitably on the Hudson river between New York and Albany, a distance of a hundred and fifty miles. Fulton did not invent any part of the machinery in his boat nor was he the first to combine a hull with an engine paddle-wheel, a shaft and a crank; this combination made up most of his contribution to steam navigation,—but he had the merit of being the first person to put these things together in such proportions and in such a manner, that his boat moved rapidly, at moderate expense, yielding a profit to its owners and making steam navigation an industrial success.

The result of Fulton's experiment was promptly heralded, as a great event, throughout the United States and Europe. Other steamboats appeared in rapid succession. In 1808, one made a trip by sea from New York to Philadelphia; in 1811 another was launched on the Ohio river at Pittsburg; in 1812 a steam ferry was established between New York and Jersey City; and in 1838, the Great Western began to make regular trips across the Atlantic. In 1836, the screw which had been tried long before, for boat propulsion, came into regu-

lar use and it has now superseded the paddle-wheel in the large steamers. The importance of combining great power and high speed with small space in ocean navigation, has led to the construction of marine steam engines which differ much from all others, and which in the opinion of Thurston are "the greatest of all triumphs of mechanical ingenuity."

Sec. 94. *Railway.*—As the steam engine had been working in obscurity for half a century before it was raised to worldwide importance by James Watt, so the iron railway had been used in a small way for two generations before it was lifted into prominence by George Stephenson, who when an engine-wright in 1812 began to study the question of steam transportation by land. He superintended the construction of a steam railway for hauling coal in 1821 and of another in 1825. Having systematized the business of railway construction and become the only railway engineer, he was employed in 1829 to build the Liverpool-Manchester line which astonished the world by transporting passengers at a speed of thirty miles an hour. To the locomotive, he added the tubular boiler, the upward blast of the waste steam in the chimney to make a draft, and other improvements, and he substituted rolled for cast iron in the track. The railway as improved by him, rose to great prominence in the business of the most enlightened countries.

Sec. 95. *Cort.*—About 1750 Benjamin Huntsman, a watchmaker of Sheffield, discovered the process of converting wrought iron into steel of the best quality by roasting it with powdered charcoal in earthenware boxes at a temperature of about 2000°. His refined steel cost him only twenty cents a pound and was as good as the Hindoo wootz which cost \$40 a pound in England, and had long been the only material for watch springs and the best cutlery. His discovery not only rendered Europe independent of Hindostan for its supply of fine steel but greatly increased its production, and thus stimulated the cutlery industry in England.

As the greatest name in the history of fine steel is that of Huntsman, so the greatest name in the history of wrought iron is that of Henry Cort, an Englishman who in 1783 obtained a patent for a puddling furnace in which molten iron was puddled or stirred with a rake until by the combustion of some of its carbon, it became wrought iron which, as made by this process, cost only half as much as that made by the older method of burning out the carbon in a small smelting furnace. The cheapness and abundance of Cort's wrought metal demanded an expeditious way of shaping it for the market, and in 1784 he met the demand by inventing the rolling mill which produced long bars, rods, and rails of many forms and sizes, ready to be used by blacksmiths who were then the chief

consumers. Small rods of iron had been made in "slitting mills" by cutting rollers long before Cort was born, but the rolling mill, though based on similar principles, had new features and was a much more important establishment.

Sec. 96. *Bessemer.*—After finding by a series of ingenious experiments that heated air increases the brilliancy of a gas flame and the heat of a common forge, J. B. Neilson, superintendent of the gas works at Glasgow, inferred that it would save expense in smelting iron. He tried the hot air blast in 1830 and the results were a wonderful saving of fuel,—five tons of coal for every ton of pig iron,—a great increase in the size of the furnaces, and a considerable reduction in the amount of manual labor required in producing a ton of iron.

Pig iron ordinarily contains about two pounds of carbon in a hundred; wrought iron contains about half as much; and the half was burned out by Cort at an expense of \$10 for a ton of iron. In 1855, Henry Bessemer burned out the carbon by blowing air through the molten pig at an expense of less than \$5 a ton; but his crucible did not diminish the quantity of sulphur and phosphorus, and the iron was rendered brittle by the excess of these elements. His process was a failure for iron ores generally, until S. G. Thomas discovered that a crucible with an alkaline casing would draw out the sulphur and phosphorus and produce an ex-

cellent metal. The Bessemer process thus improved was specially valuable for the production of cheap steel now used for railways, ships and houses; under its influence the consumption of steel has increased ten fold within half a century. In 1862 William Siemens invented the regenerative furnace which uses the refuse gases to heat the blast, thus making an important reduction in the expense of smelting. He also devised a furnace which made steel better than that of Bessemer and cheaper than that of Huntsman.

Dudley, Darby, Huntsman, Cort, Neilson, Bessemer, Thomas and Siemens are the men to whom the world is mainly indebted for the great modern reduction in the cost of iron and steel, and for the vast increase of their annual production from 100,000 tons in 1750 to 50,000,000 tons now. All these men were Britons by residence and all except Siemens, Britons by birth. About 1750 the average English furnace turned out three hundred tons of iron in a year; now it turns out nearly as much in a day. Then seven tons of coal were needed to make a ton of iron; now little more than one ton is required.

Sec. 97. *Slide Rest.*—The increased production of iron, and the active demand for steam engines, steam ships, steam wagons, and carding, spinning, weaving, printing and mining machines, have stimulated all our arts of working metal and wood. Among the most notable inventions is the

slide rest which contains one of the fundamental principles of the automatic machines to plane and turn metal. This device which first gave accuracy of fit to metallic machines and thus diminished friction and saved power, is of unknown origin. It was used, perhaps invented, by Sylvanus Thorne of Rhode Island, who employed it in turning iron spindles in 1791. A little later the same device appeared in the apparatus of M. I. Brunel in machinery for making pulley blocks, but its principle was known to few or its importance was not extensively recognized among machineists until it was applied in the iron planing machinery of Maudsley with whom it was perhaps original as well as with Thorne and Brunel. The cut-nail, the screw and the pin machines are American inventions, and so are many machines for the automatic production of various parts of small firearms and watches. The wire nail machine is of European origin.

Sec. 98. *Wood*.—In tools and machines for working wood, the Americans have taken the lead, partly because they had forests unequalled in the quantity and variety of large trees containing timber most valuable for many industrial uses. They invented their axe,—peculiar in both head and helve,—an instrument of unequalled efficiency in the work of the wood-chopper, who had a large part to play in opening to settlement the lands east of the Mississippi. The sawmill was much

improved in the United States by gang saws, movable saw teeth, wood-slicing knives, and devices to handle logs and carry away sawdust and other refuse. The wood-planing machine, the machines for making sash doors and boxes, the screw auger and the sharp pointed screw for soft wood, are of American origin. I have been unable to trace the circular saw and the bandsaw to the places or dates of their origin.

Sec. 99. *Textile Machinery*.—Since 1750 the methods of cleaning, carding, spinning, weaving, bleaching and printing textile fibres and tissues have been revolutionized by a series of inventions and discoveries remarkable for their number, their variety, their ingenuity, and their efficiency in saving labor. These industrial improvements began in the manufacture of cotton, the cheapest material for clothing. As compared with flax it can be produced in three fold and as compared with wool in ten fold quantity from an acre of ground, and it can be manufactured into cloth with much less expense than either of those two materials. It is warmer than linen; it is whiter, and for an equal weight is stronger than wool; it takes dyes more readily and shows them more clearly than either. It is the material of more than three fourths of the clothing of the world.

The cotton plant is indigenous in Mexico, Peru, China and Hindostan, and from the last-named country was taken to Egypt, and thence to Sicily

and Spain, where it was cultivated by the Arabs. In the later centuries of the Medieval Period its fibre was imported into Italy and Flanders where it was used for the tram or transverse yarn of fustian, the warp or longitudinal yarn being of linen. After Great Britain became the mistress of the seas, about 1715, she imported considerable quantities of cotton from India and Egypt, spun it on her own wheels, wove it on her own looms, and exported the surplus in her own ships, thus supporting, enriching and educating her artisans, merchants and mariners. In 1738 the fly shuttle, of much value for weaving cloth more than a yard wide, was invented. In 1748 a carding and also a spinning machine appeared, and though they did not make any saving in labor, they were the beginnings of numerous textile inventions which had their origin in England because prosperous shipping, accumulating wealth, active manufactures, high wages, and popular confidence in the national prosperity stimulated enterprise.

About 1763, a spinning wheel belonging to James Hargreaves, an industrious and ingenious English cotton spinner, was knocked over while running, and when lying down it continued to run and drive its spindle. The sight suggested to him the idea of attaching a number of spindles to one wheel, and when he tried the experiment, he found that he had strength enough to drive twenty spindles from one crank. He made a machine called

a jenny, with which he could spin ten times as much as with a common wheel. He tried to keep his invention secret, but the spinners of his neighborhood suspected him, mobbed him, destroyed his machine, and drove him from his home at Blackburn. He moved to Nottingham, where he spent the remainder of his life as a moderately prosperous cotton spinner, though he derived little profit from his invention, which was not protected by patent.

The success of Hargreaves stimulated the ambition of an English barber, named Richard Arkwright, who in 1768 invented his spinning throstle, in which the cotton passed between two pairs of rollers, the second pair revolving at a higher speed and drawing out the material. The throstle was superior to the jenny for most of the purposes of the spinner. By making a more even yarn, and giving a harder twist, it produced a strong cotton warp, and thus led to the weaving in England of cloth that was all cotton.

In 1773, Arkwright obtained patents for carding, drawing and roving machines which prepared the fibre for his throstle. His carding machine, in which a horizontal cylinder, the surface of which is covered with cards, revolves inside of a hollow cylindrical card, delivered the carded cotton in a continuous sheet to a drawing machine, which delivered an untwisted cord about an inch in diameter to a roving machine which in its turn

gave a thinner and slightly twisted roving to the throstle that converted it into yarn.

Some of Arkwright's claims to originality of invention were disputed by his contemporaries, and in several points there is much reason to doubt his assertions; but there is conclusive proof that he was a man of great ingenuity, enterprise and business capacity. He was the first to establish a cotton spinning factory driven by water power; the first to acquire a large fortune by spinning cotton, and the first to organize the system of factory labor. The throstle superseded the jenny and was soon superseded for the production of many kinds of yarn, by the mule which combined the processes of the throstle and jenny and produced equally good yarn at less expense. It was invented in 1774 by Samuel Crompton, an Englishman. Thus within twelve years, England, which produced no cotton, had invented the three greatest cotton spinning machines.

The abundance and relative cheapness of cotton cloth made a demand for some method of printing it more expeditiously and more elegantly than the rude and slow process of stamping it with an engraved wooden block not more than eight inches square. In 1774 Thomas Fryer an Englishman, invented the cylinder calico-printing machine, in which an engraved metallic roller revolves horizontally with its lower half in a bath of dye while the upper half, after the color has been scraped

from the smooth portion of the surface, prints the figures across the whole width of the cloth. In the improved form of this machine, heated rollers drive off the moisture, so that the web is prepared to take other prints without delay and thus a mile of cloth can be printed in an hour with figures made by three or four impressions each different in color. With a calico-printing machine one man can do more work in a day than five thousand men could do by hand. In 1785, Edward Cartwright, an English clergyman, invented the power loom with nearly all the main features of the loom of our time; but some of the parts were not well arranged with relation to each other, and there was no apparatus to dress or size the yarn. These defects prevented the success of the invention until they were remodeled twenty years later by H. Horrocks another Englishman, and then the steam loom left the hand loom far behind. One man can now weave as much cotton in a day as ten could in 1780.

After the processes of carding, spinning and printing cotton had been greatly cheapened by machinery and when the steam engine was ready to furnish the power required in these processes, there was an urgent demand for an increased supply of the fibre. The plant was not cultivated extensively for exportation anywhere and the fibre was separated by hand, or by other very rude processes so that the common price of the fibre was

fifty cents a pound in Europe, or nearly ten times as much as at present. The plant had been introduced into Georgia and South Carolina, where it yielded five hundred pounds of fibre to the acre, but as, in some kinds at least, a man could not cleanse more than a pound in a day, there was little profit in the crop until 1792, when Eli Whitney, a native of Connecticut, then residing in Georgia, invented the cotton gin with which, as since improved, a man can cleanse a thousand pounds in a day. Though this machine added hundreds of millions of dollars to the wealth of the United States and Great Britain, it did not add anything to the income of its inventor. By perjury and legal trickery his lawsuits to defend his patent were defeated, and if he had not found other means of support he would have spent many years in poverty.

Cotton and linen cloths were bleached by soaking in lye, washing, spreading on the grass with occasional sprinkling, during a period ranging from four to eight months, before 1785, in which year, Berthollet, a French chemist, discovered the bleaching power of chlorine, which, however, greatly weakened the cloth. It was not until 1799 that quick and good bleaching was introduced by Thomas Tennant of Glasgow, who found that chloride of lime was as efficient in bleaching as chlorine, and less injurious to the texture.

The power spindle and power loom made for

cotton could not be used with other fibres, but, in some cases after long delay, they were modified until now flax, sheep's wool, llama's wool, camel's hair, and silk are all spun and woven, and the long wools of the sheep and the angora goat are combed by machinery, so that hand work has a relatively small place in the textile industry of our day. Josue Heilman of Elsass and S. C. Donisthorpe of England were the chief inventors of successful wool combing machines.

The first netting machine of much industrial importance, invented in 1804 by John Heathcoat, an Englishman, to make plain lace,—bobbin net or bobbinet,—is considered by some authorities the most complex of all textile machines. Many variations in it and additions to it have been made by later mechanics, and many kinds of curtains, hangings, and figured laces are now woven by steam. In the last half of the XIXth century knitting machines have taken prominent places in textile industry and many kinds of machine-knitted under garments, unknown three generations since, are now used very extensively.

Scores of men had toiled in vain for many years to make a commercially profitable sewing machine, before Elias Howe in 1841 produced his invention which was soon recognized as an important device for saving labor, and was then followed by other machines some of them still better for many purposes, including the sewing of leather in shoes.

The sewing machine now occupies a prominent industrial position.

Though the process of making cloth waterproof with caoutchouc had been known in Mexico in the XVth century, it was not introduced into Europe until 1820, and since then it has spread until waterproof clothing and shoes are necessities of life in all civilized countries. The combination of caoutchouc with sulphur has proved to be of value in the useful arts for many purposes, and Good-year who first made the combination, deserves to be classed among the notable benefactors of mankind.

Sec. 100. *Chronometer*.—After Great Britain had become the leading commercial nation, her parliament offered liberal rewards for improvements in nautical instruments including one for a chronometer that would ascertain longitude within an error of thirty miles after a voyage across the Atlantic and through the tropics. The latitude could be found with approximate accuracy, but errors of fifty miles in longitude were the causes of many shipwrecks. About 1750, John Harrison, an English watchmaker, claimed the reward, which was finally paid to him in 1765, when high authorities agreed that he had reduced the range of error to eighteen miles, and thus brought ships within sight of land. His chronometer was constructed with a compensating balance in which the unequal expansion of different metals, under the in-

fluence of heat, is made to counteract itself, on the same principle applied in the gridiron pendulum. The greater security of navigation resulting from Harrison's invention led to an increase in maritime commerce and also to an increase in the size of ships, which now are five times as large on the average as they were in his time.

Sec. 101. *Canals and Roads.*—The Manchester and Worsley canal constructed to carry coal to Liverpool, and opened in 1761, was the beginning of a new era in inland navigation. The aqueducts and tunnels of Brindley, its engineer, were considered wonders of the world. It proved so profitable that many other canals were cut, and they contributed much to the great industrial prosperity which Great Britain enjoyed soon afterwards. The need of hard smooth roads leading to the towns on the banks of the canals, led to the making of graded roads covered with pebbles or broken stone, and in 1765 John Metcalf, a blind Englishman, became famous by his success in the construction of turnpikes. Thomas Telford, a Scotchman, adopted and improved Metcalf's methods which were carried to their highest development by John Macadam another Scotchman. These roads multiplied rapidly, greatly stimulated traffic and travel, and instead of diminishing the demand for labor, as had been predicted, increased it and thus caused a rise in the rate of wages, and the price of land.

Sec. 102. *Light*.—The light used by most Europeans in 1750 was furnished by oil burning in the open saucer-like lamp of ancient pattern, smoking much, giving little light and often spilling its oil. Middle class people had candles of tallow, and the rich of wax, and both needed frequent snuffing while their light was poor. The lamp chimney of glass and the circular wick invented at Geneva by Argand in 1782 supplied a much better draft to both sides of the flame than did the open lamps and, while improving the combustion and diminishing the smoke, greatly improved the light. The Argand lamps were more satisfactory for illuminating purposes than candles. In 1792 William Murdoch invented apparatus for using gas made out of coal for lighting his house, and a few years later it came into extensive use, and for many purposes was found more satisfactory than oil. About 1860 refined petroleum superseded other oils for illumination because of its cheapness and superior brilliancy; and the electric light made its first appearance ten years after kerosene. The relative cost of the vegetable and whale oils is twice as much as that of kerosene or gas, and the candle costs about four times as much as the vegetable oil. In some places, electric light is cheaper than gas or kerosene.

The friction match first appeared in England about 1825. A lecturer on chemistry, Isaac Holden, learned from his teachers that chlorate of

potash is a fulminant and can be kindled and exploded by friction. For the purposes of showing its properties to his students, he mixed it with sulphur, dipped a little wooden stick into the mixture and after this had dried, rubbed it on sand-paper, thus setting the sulphur and then the stick on fire. One of his pupils either made or taught somebody else to make friction matches for sale. Before the appearance of friction matches, fire was made with flint and steel, and saved by covering live coals with ashes; flames were readily obtained from these coals with the aid of sulphur matches,—splinters of soft dry wood which had been dipped into melted brimstone.

Sec. 103. *Telegraph*.—The XIXth century has achieved one of its greatest triumphs by taming electricity. In 1752 before which year that force was a mere plaything, and a very little plaything, a product of friction, a combination of little sparks and shocks, Franklin proved its identity with lightning; in 1782 Volta obtained it from chemical action; in 1820 Arago discovered that by running round an iron bar it converted the bar into a magnet, but that the magnetic attraction ceased instantaneously when the current stopped; and in 1833, S. F. B. Morse used this instantaneous magnetization and demagnetization of iron as the basis of his electric telegraph which in 1844 was tried successfully over a line thirty miles long, connecting Washing-

ton and Baltimore. He was not the first person to send intelligible signals by electricity over a long line of wire; but he was the first to devise a simple code of alphabetic signals for transmission over a single wire, and the first whose system was extensively applied, and was afterwards developed into the telegraphic system now used by all civilized nations. The chief features of the present electric telegraph are the single wire, the Morse alphabet, the sounder and the relay. The sounder was the natural and necessary development of the apparatus for turning the current on and off, but was not projected by Morse, who intended that the messages should be printed at the point of delivery, not read by the ear. Without intending to make the sounder, he made it. The relay, a second chemical battery to strengthen the electricity at the receiving station, an important part of the working telegraph, first came into prominence in Morse's telegraph, but was claimed by Charles Wheatstone, and was probably first conceived by him. As an aid to commerce, to education and to political order, the telegraph has exerted a vast influence. It may be considered the nervous system of civilization. Electricity having been broken to harness by Morse, was compelled to toil in new branches of industry by Graham Bell, who in 1872 invented the telephone, and by Siemens, who invented the dynamo which produces electric light and drives the electric car, and many kinds of machinery.

Sec. 104. *Agricultural Improvements.*—About the middle of the XVIIIth century, the efficiency of the plow, the most important of all agricultural tools, was doubled by the iron moldboard, an invention of James Small, a Scotchman. The wooden moldboard previously used was rough in surface, bad in shape and in most plows was set at a wrong angle, so that the friction was unnecessarily great and the sod was not turned over well. When the making of the moldboard was given to the blacksmith, and especially when plow-making became a separate occupation, the patterns were much improved, with the results that the draft was lighter, the team got over more ground in a day, did the work in better style and secured a greater yield of the acre. In 1768, James Meikle, a Scotchman, obtained a British patent for an improved fanning machine, which combined a blast of air with shaking riddles to separate grain from chaff. The fan which he improved was of Dutch origin. Andrew Meikle, a son of James, invented the threshing machine, a decided improvement on the older methods of threshing with the flail, or by treading out with cattle.

Drainage through tile pipes several feet below the surface of the soil, upon trial by Mr. Smith of Deanston in England, proved to be of great benefit to crops on clay soils in moist climates. It gave to the farmer twice as many days in the year as he had before for cultivating his land, hastened

the times of sowing and harvesting; increased the efficiency of his tillage, and the amount of his crop and lessened the cost of production. On pasture land previously very wet, it destroyed the coarse aquatic plants, increased the nutriment in the other herbage and prolonged the season of growth.

Agriculture is indebted to Americans for many improvements. With cheap land and dear labor, they had strong inducements to study out new machines and new methods. The reaping machine with which they could cut five times as much as with the cradle, the mowing machine, the horse rake, the stacking derrick and the gang plow are among their contributions to industry. The reaping machine, which, according to trustworthy estimates, saves \$100,000,000 annually to mankind in the cost of harvesting grain, was invented in 1831 by Cyrus H. McCormick, a native of Virginia. He inherited from his father the trade of blacksmith and also the scheme of cutting grain by horse power. He took out his patent in 1834, but as there was little demand then for his machines, he did not devote himself to their production until 1837, nor make many of them till 1847, when he sold seven hundred. Four years later he and his reaping machine were famous throughout the world. The main features of his invention are a vibrating sickle, a reel to pull the grain against the sickle, teeth to prevent the grain from being pushed sideways by the sickle, a level platform or

apron to catch the cut grain, and a rake to throw it off at the side in quantities suitable for sheaves. Later additions tied the grain in sheaves, or threw it into a wagon or threshing machine moving alongside of the reaper. The mowing machine had the sickle and teeth without the reel, platform or rake of the reaper.

Robert Bakewell (1726-1795), an Englishman, first gave great publicity to the method of artificial selection by which domestic animals are modified for special purposes. His eminent success in producing the Leicester sheep, and the generous spirit with which he explained the principles of his action, soon led to the appearance or decided improvement of the Cheviot, the Lincolnshire and Wiltshire sheep, the Ayrshire, Durham, Devon and Alderney cows, and the Clydesdale, Yorkshire, and Suffolk horses, each valuable for a special purpose or fitted to thrive under peculiar conditions. These breeds not only increased the value of farm products, but added to the income of agricultural land and stimulated the intelligence of the farming class.

A notable feature of the agriculture of the forty years between 1850 and 1890 was the great increase in the production of many prominent articles of commerce, amounting to three hundred per cent in sugar, two hundred and fifty in cotton and tea, one hundred in wool, sixty-five in wheat and coffee, and forty-five in tobacco. On the other

hand there was a large decrease in madder, indigo and cochineal, because these dyes were superseded by others obtained with less expense from coal tar.

Cheap transportation by steamship and railway has increased the value of land in new or thinly populated regions, and has diminished it in old countries. Since 1868 it has taken a million British acres from grain and given them to grass, has driven many thousands of New England farmers to seek new homes in the Mississippi Basin, and has much reduced the profits of tillage in some lands and increased them in others.

Sec. 105. *Mineral Products.*—The discovery of the auriferous deposits of California in 1848 was followed soon afterwards by the opening of gold and silver mines in Australia, New Zealand, Nevada, Colorado, Montana and South Africa; by the migration of hundreds of thousands of enlightened people to regions previously occupied by savages; by the opening of the shores of the Pacific ocean to an active commerce; by great improvements in many processes of mining and metallurgy; and by a vast increase in the production of the precious metals. The total annual crop of gold and silver was about \$30,000,000 in 1750, and now it is \$375,000,000 or more; and more than three fourths of the present crop comes from regions which yielded no metal a century and a half ago.

In August, 1859, a subterraneous deposit of petroleum was found by boring in western Penn-

sylvania, and the liquid which had been used previously for liniment, proved when refined, to be much better as an illuminant and much cheaper than whale oil or candles, which then furnished most of the artificial light of civilized countries. The production of petroleum suddenly became a source of great income to Pennsylvania, and afterwards to Southern Russia. Carbonate of soda, which had been obtained previously by burning marine plants, was extracted in 1820 from sea salt by a cheap chemical process suggested by Leblanc, a French chemist; and one result of the reduction in its price was a large increase in the quantity and quality of soap, and a great improvement in the cleanliness of civilized people generally.

Sec. 106. *Money*.—Since 1750, the science of money has made great advances, with the aid of more intelligent legislation, more extensive political experience and more thorough study of financial problems. No civilized government would now dare to debase its coin, to issue irredeemable paper in immense quantites, to fix the prices of labor and grain, to farm out the collection of its taxes or to sell its offices as many European governments did several centuries since. All the numerous and varied legislative attempts to fix relative values, whether of one kind of metal with another, or of money with labor or grain, have failed discreditably; and now wise statesmen are agreed that governments should not attempt by

law to fix prices, which, in their nature, depend on supply and demand, and are therefore beyond the control of any political management.

The best monetary system the world has ever seen was that established in Great Britain under principles laid down by Parliament in 1816. Gold was made the standard of value; silver was coined for needful small change as token money, and overvalued so that no one could convert it into bullion at a profit, but limited in quantity so that it could not be used for buying up gold for exportation; and paper money was printed in large bills convenient for transportation, and always redeemable in gold. The majority of enlightened nations have adopted the English system, and money is more trustworthy than ever before.

Within a century and a half, many changes have occurred in the forms and distribution of wealth. In 1750, as for thousands of years previously, the bulk of European capital was in large tracts of agricultural land, with its buildings, herds and serfs or slaves. Towns with their shops, tools, ships, merchandise and fortifications were much inferior in aggregate value. Now the urban and movable property greatly surpasses the rural in amount, and many of these forms are in the new shapes of mills, railways, steamships, telegraphs, telephones, gas works and furnaces, which are owned by incorporated companies. The capital of the world is accumulating with a speed

never approached in any previous era, and a very large proportion of the increase is in the urban and personal classes of property.

Sec. 107. *Migration.*—In this era for the first time immigration became one of the great sources of national wealth. More than 18,000,000 Europeans left their native countries to become permanent settlers in other parts of the world, to which they took at least \$50 each in money, and to which by their labor and industrial skill they, on the average, added at least \$1000 to the value of the land. The American Union attracted 15,000,000 of these immigrants, and thus added more than \$15,000,000,000 to its wealth within a century. Such a gain of men and money would have been not only impossible but inconceivable in any other era.

Sec. 108. *Factory System.*—A prominent feature of the steam Era is the factory system, which has succeeded to the small shop in industrial production. In 1750 most of the people of Europe dwelt in the rural districts, each of which was self-sufficing, producing its own food, clothing, furniture, tools and nearly everything except iron. Its carding, spinning and weaving were done in the dwellings, and mechanical work generally in small shops that did not employ more than two or three workmen, who in many cases went into the fields during the harvest. Money was scarce and most of the traffic was by barter.

The factory transferred work from the village to the city and substituted steam for muscular power, machines for tools, money payment for barter, special for miscellaneous work, and cheap for dear production. It demanded superior capacity and education in its managers, and greater punctuality and skill in its workmen, and gave them higher wages. By keeping them at the same task, it economized time, and led to the invention of numerous labor-saving machines that would have had no value in the cottage system.

The factory necessarily led to the development of capitalistic production, by which large sums of money are invested in industrial enterprises, under highly competent management, employing the most skillful laborers, reducing the relative expenses by the magnitude of purchases and sales and, by strict economy in all departments, making a good profit while selling at the lowest prices.

Incorporated societies were relatively few in 1750, and the most noted of those engaged in business enterprises were the British East India Company, the British Hudson's Bay Company and the Netherlandish East India Company, each of which had the grant from its national government of an exclusive right to trade with an extensive region in America or the East Indies. It was not until a later date that corporations to mine and roll iron, to spin and weave cotton and wool, to build canals and railways, to main-

tain lines of steamships, and to do many other kinds of work on a large scale, became prominent in civilized nations, and especially prominent in those countries where business was most active. Corporations are now indispensable to high national prosperity because they can collect large capital more quickly than separate individuals could, and because, by dividing the risk among many, they are more ready than capitalists, acting singly, to undertake very costly enterprises. As a general rule, the larger the capital of the corporation, the better the quality of its products, the lower its selling prices, the higher its wages and the more liberal its treatment of its laborers. The foreman of a factory is seldom out of the range of witnesses, and therefore is rarely insolent, whereas the master of a small shop with a single journeyman under him often gives way freely to brutality.

Sec. 109. *Steam Power.*—Nearly all the steam engines, with probably 100,000,000 horse-powers in the aggregate, and, in addition to these, 40,000,000 horses, belong to the Christian nations which in these mechanical and brute assistants have twenty times as much productive force in proportion to population as have the Chinese and Hindoos. Steam enables the enlightened man to obtain a larger supply of the necessities of life from the same amount of toil, and thus to undersell his rivals in the market, to earn higher wages, and to

live more comfortably. The pay of the average laborer is at least ten times higher in the United States than in China, and his mode of life is more luxurious.

Among the Euraryan countries, the steam engines are distributed unequally. For each hundred of inhabitants, there are thirty horse-powers of steam in the United Kingdom, twenty-five in the United States, eighteen in Germany, fifteen in France, six in Italy and three in Russia. In many kinds of labor-saving machinery the American Union considerably surpasses Great Britain, and nowhere else is so small a portion of the work done by human muscle. Twelve tons of grain for each laborer are the average annual product of the farming land in the United States, and three tons in Europe. The difference of four to one is to be credited partly to the greater area of land tilled by the laborer, and partly to the superiority of his agricultural machinery. The population of Europe is 370,000,000, five times greater than that of the United States; its grain crop and its production of manufactured articles are twice as great. Three Americans produce as much as six Europeans.

A noteworthy characteristic of our time is the constant improvement in the quality and rapid increase in the quantity of labor-saving machinery. Within the last thirty-five years the productive capacity of the cotton spinner and also of the cot-

ton weaver has been increased three fold, a very wonderful development to be made after steam spindles and looms had been used extensively for half a century by the most enlightened nations.

Machines, that is complex tools, and especially those complex tools which cannot be used without more power than that of a single man, had a small part a century and a half ago, and now a very large one in the industry of civilized nations. Our thread is spun, our cloth is woven, our clothes and shoes are sewed, our iron is rolled and forged, our wood is sawed and planed, our paper is made, our books are printed, our wagons and ships are driven, our tunnels are dug and our ores are hoisted and crushed by inanimate forces hitched to machinery.

Steam is highly economical. The power of the horse costs twice as much, and that of the man thirty times more. The aggregate of the mechanical force in steam engines was twenty-five times greater in 1895 than in 1845; it increases about ten times faster than civilized population, and is now equal to 100,000,000 horse powers or 1,300,000,000 man powers. It has stimulated the production of coal and iron to an equal activity, and with the aid of these minerals controls many of the leading branches of industry.

The steam-driven machine has not only superseded the hand tool, but in many occupations it has been superseded again and again by an im-

proved machine, each in its turn economizing force, material and superintendence. Cheap transportation and free trade or trade nearly free give opportunities for the accumulation of immense fortunes by transferring factories and furnaces to those places where production is cheapest; the highest scientific knowledge and managing talent are constantly searching sites for new industrial establishments, and great amounts of capital are always ready for investment in such enterprises. Millionaire competes with millionaire for the patronage of the multitude. The methods of production change with a frequency and a rapidity for which no parallel can be found in previous eras.

Sec. 110. *Productive Power.*—Authors who have made special studies of the occupations connected with the production of cloth and clothing, tell us that with the help of steam and machinery a person can now separate one hundred fold more cotton fibre from the seed, and card fifty fold more, and spin 1500 fold more, and weave ten fold more, and bleach a hundred fold more, and print one hundred fold more, and sew ten fold more in a day than he could have done in 1750 with the tools, machines, and processes then in use. Every particle of textile material in a sewed garment of printed cotton now goes through these seven processes of separating from the seed, carding, spinning, weaving, bleaching, printing and sewing, and the

aggregate of economy of labor in such a garment, obtained by multiplying together the savings of each of the seven processes, amounts to 7,500,000,000,000; meaning that so many days' work would have been required a century and a half ago (when however many kinds of printed cloth now made could not have been produced by the combined toil and skill of the world) to make what can now be made by the work of one day.

We must bear in mind however that in 1750, the artisans of the classes mentioned, did their work alone with the aid of very little capital, using their bare hands, without tools or chemicals in cleaning and bleaching, and simple tools in carding, printing and sewing, and simple machines in spinning and weaving; whereas now each of these processes demands not only a complex and costly machine, or set of machines, but also steam power, with engine-wrights, stokers, and attendants of many kinds and a vast capital, to furnish buildings, material and management, the aggregate and separate cost of which have not been calculated for us by those who have the best opportunities to understand them.

In some parts of the United States now, the ordinary daily task of a man of plowing is twenty fold greater than it was among the English in 1750; the sowing task is twice as large; the reaping task forty times greater; the threshing task fifty times greater, and the transportation tasks

from the farm to the mill and from the mill to the place of consumption, each ten times greater.

A considerable part of man's increased power of production is the result of the division of labor by which he acquires superior skill in one specialty. In the time of Adam Smith, pins and nails were still made by hand, and he saw that a man working alone could make twenty pins in a day, but that by dividing the labor and devoting himself entirely to a small part of the work, his share for a day amounted to 4800 complete pins; so that his efficiency was increased two hundred fold by the division. Since Smith wrote his "Wealth of Nations," machines have been constructed which under the management of one man make 20,000,000 pins in a day, an increase of 4000 fold. The production of nails has kept nearly even pace with that of pins.

In ancient times a steel furnace made about three pounds of steel for each workman in a day; the Cort puddling furnace invented in the XVIIIth century produced five hundred pounds; the Bessemer crucible turns out 50,000. A pound of steel, in the form of certain articles made to be used as parts of fine watches, sells for as much as 600,000 pounds of cast iron, and owes its relative high price to its passage through numerous processes and machines most of which were unknown to the ancients.

The net increase of man's industrial power in the most enlightened nations since 1750, after making allowance for the capital invested, machinery, buildings, raw and manufactured material, labor and management, has been variously estimated from fifteen to fifty fold. The smaller number is the safer one for general acceptance until the appearance of a better array of evidence on the subject than has yet been published. Unfortunately the necessities of life are not fifteen fold cheaper than they were a century and a half ago. A large part of the increased efficiency of labor has been spent in supplying new wants, and more liberally supplying wants that were then felt by many and gratified for a few. Many things that were beyond the reach of the rich in the time of our great-great-grandfathers are now within the reach of the multitude.

Recently, for the first time since the beginning of history, the food of Europe has increased more rapidly than the people. Vast areas of fertile soil have been brought into cultivation; the relative price of the crop has diminished; the regularity of the supply has increased. By improved transportation grain, fruit, kitchen vegetables, meat, and fish are supplied far from their places of production, in vast quantity and excellent condition to poor as well as rich. This enlargement of the food supply has been accompanied by a notable check to the multiplication of the people.

Sec. 111. *Steam Era Polity*.—The Steam Era has emancipated 20,000,000 slaves and 70,000,000 serfs and destroyed human bondage in Europe and America. In many countries it has overthrown absolute monarchy, class privilege, ecclesiastical persecution, and sacerdotal control over state affairs. It has opened schools for 50,000,000 children, made universal education a duty of government, and added 100,000,000 to the numbers of adult males possessing political power and as many to the list of landowners in Christendom. It has greatly diminished the relative frequency, duration and destructiveness of warfare, and has thus given to civilized nations a feeling of general security, previously unknown. By destroying the privileges of the nobles and despots, who caused most of the wars in earlier periods, by increasing the intelligence and political power of the multitude who were the chief sufferers by invasions, and by forbidding the enslavement of men, the plunder of property, and the persecution of unbelief and heresy it has destroyed the motives of aggression most potent in many previous ages. The world has recently seen the nations, possessing the most powerful armies and navies, combining to protect their weaker neighbors, preserve peace, provide for the care of the wounded and establish uniform regulations for postage, weights, measures, coins, copyrights, patents and other matters of common interest. These changes are in the ag-

gregate more important than those made by the preceding 10,000 years in the same department of life.

Sec. 112. *British Government.*—The British Government has been changed from an aristocracy to a democracy. In 1750, three hundred rich Englishmen could control the election of a majority of the House of Commons; now there are 3,000,000 independent voters and not one member of Parliament owes his place to a single patron. Appointments in the civil, naval and military service, instead of being distributed by favor as they were in the last century, are now given by merit shown in a competitive examination. The administration has been reformed in its local as well as in its national departments, and the government in nearly all its departments is a pattern of excellence.

George III tried to overthrow the system of cabinet government, and as he was a man of strong character and industrious habits, he obtained great influence over some of his ministers, and with their help might have done much to increase the royal authority if the course of foreign affairs had been propitious; but he made a great mistake in trying to coerce the American colonies; and their successful resistance to him greatly weakened his influence at home. Before he recovered from that blow, the French Revolution occurred, and then the British Parliament would not listen

to reactionary ideas. The increasing intelligence of the people and the advance of political liberality in America and Europe aroused the Britons to demand Parliamentary reform which was granted in 1832, after a stubborn resistance by the nobility and clergy, and after a threat that if the House of Lords should refuse to pass the bill, enough liberal lords would be appointed to swamp the Tory majority. The King was as hostile as the lords but having been warned that the people were aroused and if the bill should be defeated, his crown would not be secure, he yielded.

The Reform Act disfranchised many rotten boroughs (electoral districts with few voters), distributed the representation in proportion to population, extended the suffrage, transferred the control of the government from the nobility to the middle class, and greatly reduced the influence of bribes in parliamentary elections. Three years later it was followed by an act reforming the city charters, extending municipal suffrage, and enlarging the sphere of local self-government. Other reforms have continued to follow at brief intervals, abolishing the import duties on food, extending the national suffrage, opening the public service to superior capacity, establishing a free school in every parish, reforming the judicial system, and strengthening the popular influence in the government of the counties and rural districts. In everything save name Great Britain is now a republic.

Sec. 113. *Britain's Advantages.*—The best government in the world, the one that surrounds its citizens and subjects with the most secure protection, the one that has enabled them to secure the largest relative share of wealth and power and the one that has contributed more than any other to political progress is that of Great Britain. The causes of its unparalleled success have been its maritime wall protecting it against invasion, its fertile soil, its equable climate, averaging 40° in January and 65° in July, its great abundance of coal and iron ore, its numerous good harbors and navigable rivers, the excellence of its timber for building purposes, its superiority in size and resources to its neighboring island, Ireland; and its central position for maritime commerce between the Baltic and the Mediterranean, and between Continental Europe and America.

Sec. 114. *France.*—In 1750 the government of France was generally considered by the Latin nations to be a model of excellence; and now it appears to have been a model of wrong and folly. One-fifth of its land belonged to the crown, another fifth to the nobles who, with their wives and children, numbered 200,000; another fifth to the clergy of whom there were 130,000; and two-fifths to the 20,000,000 commoners, many of whose titles however were subject to rents and feudal dues so high that the ostensible owner derived very little profit from his ownership. No tithe was paid by

the royal domain; no royal tax by the nobility or clergy; and nearly the whole burden of the government was thrown on the commoners.

The injustice was so glaring and the oppression so cruel that the literature of the country demanded reform. A famine and financial mismanagement led to national bankruptcy and then to an assemblage of representatives of the people who started a revolution that swept away monarchy, nobility and clergy and prepared the way for a military despotism which plundered and insulted Europe, and ended with the defeat and impoverishment of France. A constitutional monarchy was established, then a new form of enlightened absolutism, and in 1870 the Republic which is now in existence. The government of France has committed many instructive blunders, but has not originated any very valuable political ideas since 1750.

Sec. 115. *Germany.*—The population of Prussia numbered about 2,500,000 in 1740 when Frederic II began his reign and it had been trebled by his conquests and by natural increase before he died in 1786. He was a wise monarch and spoke of himself as the servant of the people. He studied their wants, protected their interests, established state schools for them, enacted liberal laws and published orders that the administration of justice should be impartial. Educated men in the smaller German states looked on Prussia as the

model and nucleus of the regeneration of their nation. Prussia was plundered, impoverished, insulted and divided by Napoleon and for several years some of its chief cities and strongest fortifications were held by the French. The King, compelled by his humiliations to accept the advice of his minister Stein abolished serfdom (which had been the condition of most of the people), repealed many of the restrictions forbidding the sale of land to commoners, established self-government in the towns under manhood suffrage, and sold a large area of crown land in small tracts. Thus a nation of serfs was converted into one of freemen owning small farms. Hardenberg, who succeeded Stein as prime minister, introduced the system of requiring all adult males to serve in the army, which thus became the nation in its militant form. The people welcomed the new institutions and defended their country with such energy that Napoleon was overthrown and Prussia rose to be a great Power. In 1855 her leading men, foreseeing that France would seize the first good opportunity to appropriate the German provinces west of the Rhine, began to prepare for the emergency. The system requiring every man to become a well trained soldier was strictly enforced in 1861, and was submitted to by the people because they were extremely anxious to protect their country from such spoliation and insult as it had suffered from 1806 till 1813 and also because they hoped that

superiority in arms would enable them to bring the greater part of Germany under the control of their government. These expectations and hopes were verified in 1870 when France attacked Prussia, and within two months was overwhelmed by the greatest series of victories ever achieved in so brief a period. She was despoiled of Elsass and Lothringen; and the German empire was organized with the King of Prussia as emperor. The superiority of the Prussian military system was so unquestionable that all the other great military powers of continental Europe,—Austria, Russia, France and Italy,—were compelled to adopt it.

The subjection of all the men fit for arms to compulsory military service for several years is highly expensive but is not without compensations. It requires the rich, half rich, poor and very poor men to associate together intimately for a long term, and takes away the insolence of some and the servility of others. It teaches good manners, dignity, equality, punctuality, cleanliness, and business habits, and weakens provincial prejudices and dialects. It is a school for adults, good for many things besides making soldiers.

Sec. 116. *The United States.*—By her wars to foster her commerce and extend her dominion, Great Britain had incurred a great debt, and in 1765 she levied taxes on her American colonies which, as her parliament claimed, had gained greatly in security by the conquest of Canada, and should bear

part of its expense. The colonies rebelled for the avowed reasons that they had no representation in the parliament which levied the tax, and that according to English political principles, taxation without representation is tyranny. With the help of France, they gained their independence, and then they established a federal republican government, under a written constitution, with a weak national administration, and strong, semi-independent provinces, improperly called states. The new political system had many original features and some great merits. It prohibited entail, primogeniture, hereditary title and privilege, separated the state from the church, provided that the people should be educated at the public expense, and offered its vast areas of fertile public land to settlers in small tracts so as to attract desirable immigrants from Europe and to induce the poor of the Eastern States to become landholders in the West. Such an increase of population, such a development of wealth, such a general prosperity, such a dominating spirit of political and social equality were never seen elsewhere.

The prosperity of the Union was not continuous. In 1861 ten States combined in a rebellion because the federal government would not permit the establishment of slavery in all the Territories, and thus they brought on a war which, after costing the loss of about 1,000,000 lives and the expenditure of \$10,000,000,000, ended with the destruction

of slavery. The vanquished were treated generously by the victors and harmony as well as peace was restored.

Sec. 117. *Corruption*.—With some remarkable merits, the political system of the United States has many serious defects. The federal authority can not define, administer or enforce the laws relating to suffrage, education, direct taxation, the ownership of property, the protection of civil rights, land ownership, commercial contracts, inheritances, matrimony, divorce or the punishment of crime. It has no control over the police of cities or the militia of the States, and these are the majority of soldiery in the country. It has no right to interfere, within the limit of a state, to suppress a riot or insurrection unless at the request of the governor; and in three or four great riots, continuing for weeks, the governors did not call for such aid. The constitution does not contain the word "nation" or "national" and, by these omissions, indirectly admits that it does not lay claim to the complete allegiance which belongs to sovereignty.

Each of the two score States,—which, as the constitutional lawyers say, "have reserved" to themselves the most important powers,—has its own set of laws, in many cases highly defective and peculiar. There is no attempt to secure uniformity. The deeds, wills, contracts, promissory notes, marriages and divorces valid in one place

are void in another. But all the States fill for short terms, by popular election, a multitude of offices which in an efficient and economical government must be filled by appointments during good behavior. The government is the most extravagant and the most corrupt in the enlightened part of the world; the officials generally are the most incompetent and disreputable. Public opinion has no faith in the integrity of the average city council or state legislature. Embezzlement of public funds when discovered is in most cases, concealed systematically by those who should make public complaint or institute prosecutions. Many administrative offices that should be held for life under appointment are conferred for short terms by popular election as rewards for partisan service; and therefore in a large proportion of cases the incumbents are incompetent and dishonest. The system of electing members of legislative bodies is also highly defective. The government as a whole is far below the level of the political science of our time, a gigantic blunder and a national disgrace.

Sec. 118. *Warfare*.—The weapons and methods of warfare on land and sea have changed completely within a century and a half. The large and small fire arms are no longer muzzle-loading, slow-firing and short range smooth bores. The flint-lock of the infantry has given way to the cap-lock, and that to the needle lock. The cannon

ball instead of being of round and solid cast iron is oblong and usually a shell of steel. New kinds of powder are used, some smokeless, some much stronger than those made of charcoal. The cannon is a built up weapon made of steel, and supplied with machinery for quick loading. The material of the warship has changed from wood to iron and from iron to steel, with armor, in some cases more than a foot thick. Steam has superseded sails and the average speed has trebled. Warships have doubled their average tonnage, and reduced the number of their cannons eighty per cent; they are no longer classified according to the number of their gun decks; and their fighting strength is not now known as soon as they can be seen distinctly. Formerly the battle at sea and on land rarely began until the foes were within two hundred yards of each other; now it commences when they are a mile apart, and is decided before they get within three hundred yards. Boarding at sea and the bayonet on land have lost much of their importance. The great increase in the cost of weapons and ammunition,—the latter was almost unknown to antiquity—has done much to change the art of war and to secure success in it to the rich nations.

Sec. 119. *Steam Era Sociality.*—The social relations have been much modified since 1750, especially in domestic life, dress, education, science, amusements, and the healing art. The average

home has been revolutionized by its transfer from the village to the city, by the withdrawal from it of the spindle, the loom, the knitting needle, and the slave, or serf; and by the introduction into it of the cooking stove, the porcelain cooking pot, the sewing machine, cheap cotton, cheap soap, cheap table ware, kerosene and gas lamps, and running water, and the increased supply of fresh meat, sugar, coffee, tea and fresh fruit and kitchen vegetables. The dwelling has been improved by increasing its size, giving it a roof of tile or slate, making the floor of boards covered with carpet and by furnishing it with beds containing spring mattresses, cotton sheets and woolen blankets. The evening, instead of being spent in darkness, seclusion and dullness, is enlivened with brilliant light, interesting reading, the theatre, opera, dance,—the waltz and other round dances are new—or the stereopticon lecture.

The intellectual atmosphere has been changed in the enlightened nations by universal education, the cheap newspaper, the telegraphic reports giving every morning the news of the previous day from all parts of the world, the advance of science, the changed instruction in all grades of schools, rich modern literatures, the growth of public libraries, and the relative decline of theology.

The moral feeling of the people in civilized countries has advanced with education, freedom and commerce. There is less hatred of other classes,

creeds and nations than in previous eras, and a stronger and more distinctly expressed sympathy with humanity in general. Although the public conscience has gained increased influence, some new crimes have appeared. Ignorant men, imagining that their hardships could be remedied by violence have engaged in communistic, nihilist, and anarchist rebellions, differing from those of earlier times. One of the most active agencies, in offenses of this kind, has been the Trade Union, a combination of highly paid workmen formed mainly for the purpose of using illegal means to exclude other laborers from their occupations. The purpose of enforcing their orders by crime is the essence of their organization, and has been illustrated most forcibly in the history of Sheffield, Birmingham, Glasgow, Pittsburg, Chicago and scores of other cities.

Sec. 120. *Universities.*—About 1760 the fame of Goettingen (founded in 1737) began to exercise a strong influence on other universities. It collected a large library, gave prominence in teaching to political law, criticism, philology, history and physical science, increased the pay of its professors, selected them because of superior capacity and learning, allowed them much freedom of expression and belief, and gave instruction in the vernacular tongue. The reformation of university education, that first attracted extensive attention at Goettingen, has continued to expand as physi-

cal science, history, criticism, engineering, law, medicine and surgery crowd out the dead languages and theology. While the University has reformed its course of study, the primary school has enlarged the field of its activity. It has become a state institution; the civilized nation has acknowledged its duty to educate the children of the poor.

Sec. 121. Literature.—Our Era differs much from earlier times in the character and amount of its literature. It prints more in a day than the XVIth century did in a year. It has created large classes of daily, monthly and quarterly publications original in their purpose and vast in their influence. It has harnessed steam, electricity, photography, chromolithography and wood-engraving into its service. It has produced a grand array of dictionaries and encyclopedias, and is extremely rich in historical, scientific and industrial works. It has originated the prose romance of social life and developed it in great abundance and of high merit. It has ceased to use the dead languages preferentially; it produces all its most important works in vernacular tongues. In only one department can it show no great work; it has no epic poet who deserves a place with the ablest of the Greek-Roman, Medieval and Press Eras.

Sec. 122. Science.—The advance of knowledge has not only enlarged the range of education but by giving early familiarity with fundamental prin-

ciples, has prepared many students to understand ideas that two centuries ago were abstruse to the erudite few. The *Principia* of Newton (says W. B. Carpenter) unintelligible to the great mass of his most learned contemporaries "are now the A. B. C. of the student of the higher mathematics. The dramas of Shakespeare, appreciated by the theatre-goers of his day only for the pleasure to be derived from poetry and action, are now read and pondered by every student of human nature as the embodiment of the profoundest and most universal knowledge. And the grand symphony of Beethoven which was laid aside as incomprehensible by the most cultivated musicians of his time, is now the delight not alone of the select few but of the many whom the more advanced culture of the present generation has made capable of appreciating a great work of musical art."

Chemistry, geology, comparative anatomy, palaeontology, physiology, pathology, comparative philology, archaeology, and anthropology have appeared as new sciences and risen to great importance in learning and literature. In 1750 not one of the main principles of chemical action, and not one of the gases had been discovered. The tests of elementary substance, the atomic weights of different simples, the rules of definite proportion in their combination, the conception of chemical affinity and the relations of chemical action to various forms of physical force were unknown.

The new knowledge has done much to change agriculture, metallurgy, the mechanic arts, cookery, medicine, surgery and hygiene.

Geology, of later origin than chemistry, having made its appearance about 1780, has not only taught us how the mountains, hills, valleys, rivers, rocks and soils have taken their present shape, and how they are related to one another in the manner of their formation, but has also rendered great service in many branches of mining.

Although astronomy is the oldest of the sciences, and had made such progress among the ancient Chaldeans and Greeks, and much more in the Press Era by the discoveries of Galileo, Kepler and Newton, it has achieved many of its greatest triumphs since 1750. The power of the telescope was much increased about that time by John Dollond's achromatic lense, and since then the range of vision has been enlarged by improvements in the reflecting mirrors and refracting lenses, by the spectroscopic prism and the photographic plate. More than a hundred planets or planetary bodies have been added to our solar system, and the sun and stars have been partially analyzed. The method in which the universe took shape has been explained, and the movement of the solar system in relation to the suns has been discovered. The measurement of time which when based on comprehensive principles and applied to long periods, is an astronomical process,

made a great step forward about 1765 when John Harrison obtained the large prize offered by the British Parliament for a chronometer which would enable a mariner at sea to ascertain his longitude within thirty miles. By inventing the compensation balance, he had added much to the security and rapidity of ocean navigation.

Much of our biological knowledge has originated in our Era. In the middle of the XVIIIth century, the Linnean system of botanical nomenclature came into general use with its generic and specific names and its precise definitions and descriptions; and is still used with modifications. Not until the beginning of the XIXth century did the comprehensive classification of animals according to anatomical structure begin, and since then the relations between extinct and living species have been traced until conclusive proof has been obtained that organic life began in the most rudimentary way and gradually became more complex and more evenly developed in organ and function until it culminated in humanity. As science has advanced, the lines between man and brute, between brute and plant, and between organic and inorganic matter have become less distinct. All matter is constantly moving and in mineral substances the motion seems to be a kind of inorganic life. Vital function depends on chemical action, and now appears before us as a slow combustion in a body which collects its own fuel.

Much of our geographical knowledge is of recent origin. Before 1750, longitude was not ascertained with precision and therefore correct maps could not be made, nor had the coasts of Arctic Asia, Arctic America, Australasia, Malaysia, Polynesia, Melanesia and Micronesia been carefully traced. Large portions of North America and Africa were blanks on the maps. The head of the Nile, the courses of the Congo, the Niger and the Colorado, and even the existence of the Columbia, the Fraser, the Yukon and the Zambesi were unknown to learned men. The Europeans had vague and incorrect ideas of life in Japan, China, Hindostan, the Pacific Islands, and much of North America; and learned men among them had never even heard of Buddhism, one of the great religions of the world. The mention of such defects of knowledge in the middle of the XVIIIth century suggests the advances of geographical research in the meantime.

Sec. 123. *Recent Medicine*.—The scope of the healing art has been enlarged and its character ennobled by the rise and high development of new branches of science including physiology, pathology, histology, ophthalmology, microscopy, bacteriology, organic chemistry and comparative and pathological anatomy. Tuberculosis, cholera, typhoid fever, diphtheria, puerperal fever, leprosy, tetanus, trichinosis, glanders, anthrax and hydrophobia have been traced to special microbes,

which, identified under the microscope, have become less dangerous since their nature is understood. The three greatest triumphs in the whole history of the healing art,—vaccination, anaesthesia and antiseptic surgery,—have all originated in our Era.

Smallpox, though not so destructive to life as tuberculosis,—the former carried away about seven, and the latter about fourteen in a hundred of all human beings,—was considered the most frightful of all diseases, because it was the most common and the most destructive of all the epidemics, and because it was highly contagious and repulsive, and inflicted blindness and scrofula on many whom it did not kill. The Chinese knew, in the Middle Ages, how to moderate the virulence of the disease for individuals by inoculation, which however was not introduced into western Europe until 1722 and then though it protected most of those to whom it was applied, it changed the smallpox from an occasional pestilence to an endemic scourge and thus increased its mortality. In 1796 Dr. Edward Jenner discovered vaccination, which, when properly applied, reduces the death rate by smallpox from seventy to one, or even less in a thousand. He added three years to the average duration of human life.

Before anaesthesia was discovered the sufferings of the patient during difficult surgical opera-

tions were so acute, and his screams and struggles so trying to the surgeon and his assistants, that the work was done with the greatest possible haste, a leg often coming off above the knee, in less than half a minute after the knife began its work. Rapidity of execution was one of the highest merits of a surgeon. Because of the intensity of the pain many persons died rather than submit to difficult operations. In 1844 Dr. W. G. Morton discovered that the inhalation of sulphuric ether produced an anaesthesia of great value in surgery, and thus not only saved life and prevented pain but greatly enlarged the scope of surgery, by prolonging the time and permitting thoroughness in the operation.

The discovery about 1870 by Dr. Joseph Lister that suppuration and gangrene, which carried off three-fifths of the patients subjected to serious amputations in large hospitals, could be prevented by antiseptic treatment was of immense importance to surgery, not only by saving life in most of the cases which had previously been fatal, but by rendering possible many operations which had been regarded as beyond the hope of favorable result. The healing art has not only received new power, learning and dignity from vaccination, antisepsis and chemistry, but has become the most progressive of the learned professions. The clinical thermometer, the test tube, the stethoscope, the laryngoscope and the ophthalmoscope are

among its most common tools. It has divided up into many special occupations, as no one person has time to become a master in all its vast range of learning and technical skill. It has found certain remedies for some of the most destructive diseases, mitigated pain, and prolonged the average duration of life.

Sec. 124. *Individualism*.—Of late years there has been more complaint than ever before about the oppression of the many by the few, not because the evil or the relative number of its victims is greater, but because the multitude have lately been educated to understand their equal rights, clothed with political power to defend them, and enabled by the receipt of better incomes to reward flattering demagogues. They who were plundered now want to be plunderers; but they are divided into small classes, each of which tries to secure protection against competition so that its incompetent and lazy members shall not have to struggle on equal terms with men more intelligent and thrifty. The plans for restriction are numerous including confiscation of private property, monopoly of employment by the state and limitation in different occupations to the members of certain societies.

Three times collectivistic labor reformers obtained control of the government in Paris where they found the best field for their folly because there a high degree of political centralization in

the capital of a great nation was combined with a large and ignorant rabble and a lack of political experience among the rich and half-rich classes. In the confusion following revolutions against despotic rule, the collectivists obtained control and undertook to furnish government employment to all or many applicants at high wages without proper supervision and without provision for getting work really needed by the state. The public workshops became dens of idleness, incompetency and waste; and each of the three times the country rose and washed out the folly in torrents of blood.

A governmental blunder of communistic tendency was the English Poor Law of 1782. It provided that the parish officials must furnish work for the unemployed poor or support them in their homes, paying a liberal amount for every member of the family. The more the children, whether legitimate or not, the more money the parent or parents received. This encouragement of idleness and immorality was continued for half a century, and fifty years after it was abandoned, the evil influences were plainly traceable.

Although collectivism under various names,—including communism, socialism and social democracy,—has many adherents, mostly ignorant or superficial people, the prevalent tendency among men of learning and ability is, as it has been for generations, toward individualism, which opposes

privilege and demands that every person shall have an equal chance to get an education and to make his start in the race of life.

Sec. 125. *Religious Change.*—The Steam Era has greatly damaged the influence of the Christian priesthood. Astronomy, geology and biology have shown that the story of creation in Genesis is a fiction, and archaeology has proved that its main incidents were plagiarized by the Jews from the older Chaldean books. Biblical criticism has shown conclusively that Deuteronomy, Leviticus and the four gospels were not written at the times or by the persons to whom they have been attributed by Jewish and Christian tradition and belief.

A new religion called Monism or Scientific Pantheism has appeared and has gained many adherents among learned men. It teaches that matter and force are the only fundamental existences; that they are inseparable, indestructible, uncreatable and eternal; that space is a condition of matter and time and motion are conditions of force; that there are many forms of force, physical and psychical, all correlated and, under certain circumstances, interconvertible; that the universal force as manifested, under our observation, is predominantly orderly and good; and that we shall never be able to thoroughly understand and comprehend this universal force until we know the forms that nature has taken in other portions of the universe, perhaps much more favorable to

organic development and supplied with living beings higher in the scale of existence than the men of our earth.

Professor Joseph LeConte, who is a high authority on the question of scientific religion, after declaring his acceptance of "the immanence of Deity in Nature," adds that he regards "physical and chemical forces, or the forces of dead Nature, as a portion of the omnipresent Divine Energy in a diffused, unindividuated state, and therefore not self-active, but having its phenomena determined directly by the Divine Energy." Many scientists would strike out the word "dead" from that passage. Nature pervaded by its immanent and inseparable Deity, is not only alive, but is the only source and home of life.

Sec. 126. *Steam Era Review.*—The most influential product of our Era is machinery, which has carried Polity onward to a highly advanced representative democracy and Sociality to an intellectual development in many respects not approached in earlier times. Governments have destroyed much of the power held by priesthood in 1750; and science and philosophy have combined to remodel Religion. As in other progressive periods, Industry has been the most potent factor.

CHAPTER IX.

CONCLUSION.

Section 127. *The Eras.*—This section sums up the eras, mentioning, under the head of each, a leading feature in every one of the main branches of life; and indicating, for the sake of brevity, the Industrial by the Roman numeral I, the Political by II, the Social by III, and the Religious by IV.

The Australian Era; I, the stone knife; II, the group; III, moral obligation limited to the group; and IV, animism.

The Iroquois Era; I, scanty tillage; II, the tribe; III, tribal fidelity; and IV, fetishism.

The Polynesian Era; I, extensive tillage; II, the nation; III, national fidelity; and IV, the national god.

The Bronze Era; I, bronze; II, extensive nationality; III, writing; and IV, eternal future life under sacerdotal control.

The Greek-Roman Era; I, steel; II, constitutional government without representation; III, Greek literature; and IV, a universal religion.

The Medieval Era; I, the mariner's compass; II, representative government; III, decay of ancient literature; and IV, the Papacy.

The Press Era; I, the printing press; II, cabinet government; III, the rise of modern science; and IV, the Reformation.

The Steam Era; I, the steam engine; II, modern democracy; III, state education; and IV, scientific pantheism.

The first, second, third and fourth eras may be classed together as prehistoric or unhistorical, our information about them being obtained by archaeological or anthropological research. Authentic and continuous history began in ancient Greece, and relates mainly to the achievements of the Etruscans, the Greeks, Romans, Celts, Teutons, and Slavs, who made their homes in Europe, and their descendants, wherever they may have dwelt, or may dwell now.

Sec. 128. *The Branches.*—Each of the four main branches made an important advance in every era, except the Medieval, in which however Industry and Polity took large steps forward.

Industry has been developed mainly by the improvement and multiplication of tools, the differentiation of occupations, the accumulation of capital, the employment of brute and inorganic forces to assist human toil, and by the education and more regular employment of man as a laborer.

The great work of Polity has been to encourage Industry by protecting person and property, securing the enjoyment of earnings and savings, and giving order to society and dignity to the citizen.

In political possessions, there is no accumulation; when an improved form of government is devised, the older one is thrown away.

The task of Sociality is to educate mankind intellectually and morally, to fit him for his industrial and political duties, and to prepare him for the exercise and enjoyment of his own capabilities. With the aid of Industry, it accumulates vast treasures of literature and art, multiplies them and places them within the reach of the multitude, thus lifting up humanity in general.

In some of the eras Priestcraft which was generally regarded as the authorized representative and custodian of Religion, was the friend, but lately has become the enemy of the dominant Polity; and in the conflict has been greatly damaged. Under these circumstances, those who claim to be the only true friends of Religion are now trying to change their position and adapt themselves to the intellectual demands of the time.

Sec. 129. *Liberty*.—The most splendid fact of universal history is the development of industry and next to it is the advance of freedom, overthrowing despotism, class privilege, bondage, press censorship, ecclesiastical persecution, and a thousand minor forms of oppression. Freedom is the birthright of everybody, and means a chance for all to start equally in the race of life, and the reward of all according to their achievements. It demands free competition that the cowards, the

dullards, the shirks shall not take the prizes that they never earned, as many of them have done heretofore. It implies the final abolition of all large transmissions of inherited property to favored individuals. Its essence is equality before the law; the equality which shall stimulate all to the highest healthy activity and render the most service to humanity. Its course in the future is hidden from our view, but its final triumph is certain. The words of Edward D. Baker may be adopted by every friend of Progress; "I dare not, I will not be false to freedom. Where the feet of my youth were planted, there, by freedom, my feet shall stand. I will walk beneath her banner; I will glory in her strength. I have watched her in history, struck down on an hundred chosen fields of battle. I have seen her friends fly from her, her foes gather round her. I have seen her bound to the stake; I have seen them give her ashes to the wind. But when they turned to exult, I have seen her again meet them face to face, resplendent in complete steel, brandishing in her right hand a flaming sword, red with insufferable light."

Political liberty has been the mother, the daughter or the preferred companion of everything glorious in history. She enabled ancient Athens and modern England to lead the world in government and literature; she exalted Florence, Geneva, Holland, and the American Republic; and even when fettered by Sparta and Venice, she gave them per-

manence and power. Where she has been shut out as in Russia, Spain and the Pontifical State, there humanity has been most degraded within the limits of Christendom.

Sec. 130. *Progress*.—The numerous changes in culture, extending through all the eras, when considered comprehensively, appear to be the necessary parts of a natural growth. Their elements existed in the primitive savage, though he was not conscious of them, as the elements of the oak exist in the acorn. The development has been not only natural but orderly, logical and beneficent. It has been a movement from a lower to a higher level, from simple to complex conditions; it carries with it an increasing activity and breadth of intellectual and moral forces and makes humanity wiser, better and happier.

The greatest evils by which life has been embittered for the multitude in most countries and centuries, have been ignorance (associated with inefficiency of labor), poverty (often leading to famine), pestilence, war, arbitrary power, slavery, class privilege, persecuting warfare, the inquisition, witchburning and the accumulation of wealth in ecclesiastical possession. Some of these evils have disappeared in enlightened countries and all of them have lost much and are steadily losing more of their pernicious power.

As compared with the enlightened man, the primitive savage has a dull existence, narrow in

range of thought and emotion. He is unconscious of many faculties and tastes which lie dormant because they have never been aroused, fostered and stimulated. He lives without the pleasure which might come to him from the exercise of many of his powers. When a capacity appears for the first time, and is afterwards developed to a higher potency, and when wider spheres are formed for its employment, there is an increase of happiness. Our highest pleasure comes from the healthy and active work of all our capacities, alternating through the hours not filled with refreshing sleep, accompanied by confidence that the future has nothing worse in store for us. The higher the culture, the greater the variety of pleasures, the more prolonged their duration, and the keener their zest. Civilization has crimes unknown to barbarism, but it has a much smaller proportion of cruel wrong. If machinery has made men unhappy, then tools must have had the same influence, and as the enlightened man should envy the savage, so the savage should envy the ape.

Let us consider the differences between the life of Western and Central Europe as it is now and as it was in 1300. The interval of time and the extent of territory are large enough for an instructive and trustworthy comparison. The first difference that we observe is that three-fourths of the people have been emancipated from serfdom. They have not only become free men, but they

have been admitted to a share in the government. They have been raised from their condition of abject poverty; the majority are owners of land or have money in bank. They are not familiar with famine, pestilence and desolating warfare. They have learned to read and they possess books and newspapers. Their labor has greatly increased in efficiency. The productiveness of their acre in grain, of their cow in milk, of their steer in beef, and of their sheep in wool has been doubled. Their plow turns over twice as much ground in a day; their wagon hauls twice as much freight. The payment for their crops has changed from barter to coin. They have been the gainers by the legalization of interest, the reduction of its rate, the establishment of savings banks, the abandonment of the custom of debasing the currency, the invention of new tools and machinery, the advances of hygiene and the healing art, the improvements in transportation and the increase of machinery.

Six centuries ago all the large fortunes belonged to a small class of nobles, whose estates passed under primogeniture to the eldest son, and under the law of entail were kept in the family, which for century after century retained the same land with its inseparable buildings and serfs. Since then wealth has become fluid; the serfs have been emancipated, primogeniture and entail have disappeared in most enlightened nations; the bulk of the property has passed from the real

to the personal class, and only a small proportion of the great fortunes now belong to the ancient nobility. Besides losing their almost exclusive wealth, the hereditary aristocrats have lost their control of the high military, naval, ecclesiastical and administrative offices. They must now submit to be elbowed and in many cases crowded to the rear by the sons of the commoners, who have become bankers, manufactureres, inventors, mine owners, merchants, lawyers, orators and statesmen.

Debased by their bondage, the medieval multitude were servile in their speech, their manners and their thoughts. They were compelled from childhood to wear distinctive garments and to address their masters with titles indicative of superiority. The nobles were demoralized by their power. They claimed to be of better blood and higher capacity. In their looks and speech they showed their contempt for their subjects. Unfitted by their education to see the equality of human rights and duties, they were insolent when they imagined they were kind. A similar, but weaker, social spirit prevails now in Europe; it must prevail where most of the wealth is attached to hereditary office or title.

Different is the spirit in communities where high office, title and riches are not perpetuated; where a large fortune does not last more than three generations; where almost everybody is

nearly related to some family in which wealth has been first gained by honest thrift and then wasted by folly. The business struggles under circumstances that gave almost certain success to superior ability and energy, have taught the people of the United States, where industrial competition was least restricted, to give and take; and to make liberal allowances for those against whom they are contending. Thus has been developed an American spirit, liberal, generous and anxious for public ends. It is considerate for the weak; it makes America "the Paradise of women"; it was magnanimous to conquered Mexico and the conquered Confederacy; it leads the world in gifts to educational institutions; its list of such benefactors as Girard, Peabody, Hopkins, Cornell, Stanford, Hearst, Pratt, Cooper, McDonough and Rockefeller is unrivalled. Toward such Americanism the world is drifting.

The education of the multitude, their admission to the highest political rights, the improvements in their dwellings and clothing, the rise of many among them to wealth and learning, the social eminence of successful inventors and business managers, and the fading of lines separating classes, have led to the recognition of the principle that manual toil is honorable. Many of the hardships of poverty have been alleviated. The laborer has been protected against his own folly and dishonesty. He has been exempted from punishment for

violating his explicit written contracts. He has been relieved from imprisonment for debt. In many cases his property has been protected from seizure by his creditor. He has been made in some respects the favorite of the law; and though this favoritism has a debasing influence on some, it protects a greater number and thus raises their self-respect. They feel that they are among their equals, association with whom, John Mill truly says, is the best school of morality. The general ethical standard is much higher now in the most enlightened nations than it ever was in any state of any earlier era.

The cheapening of soap and of woven and knit cotton has enabled the multitude to obtain clean underclothes, hose and sheets; and the weekly wash destroyed the parasitic insects which had been the companions of the poor in all previous eras. Between 1780 and 1800 the fashions for the dress of men "of quality" became simpler. Knee breeches gave way to trousers; and ruffles, silks, laces, ribbons, bright colors, swords and wigs were no longer worn except at court receptions. By imitating the many, the few acknowledged the triumph of democratic ideas. Similarity of dress followed equality of rights.

Many authors have exalted the moral condition of medieval Europe as if there were no serious wrong or debasing influence in feudalism, slavery, serfdom, despotism, class privilege, ecclesiastical

persecution, press censorship, plundering warfare, debt imprisonment, insecurity of personal and property right, and retention of the multitude in gross ignorance and abject poverty. The priests lament the era when they were the masters, and are unable to understand that their triumphs meant the degradation of humanity.

The statistics of civilized countries show that there is a greater relative increase in the number of skilled than of unskilled laborers; in the fortunes of the half rich and the half poor than of the very rich; in the wages of toil and rewards of professional skill than in the income of capital; in the value of personal than in that of real property; and in the value of urban than of rural land. All these changes imply that the large fortunes, instead of accumulating in the families which were wealthiest in the XVIIIth century are now passing into new hands and are being more evenly distributed.

The poor make more complaint about their hardships than ever before, not because their hardships are greater, but because they have more leisure, more education, more industrial and political independence, more intimacy among themselves, more opportunity in that intimacy to intensify their class feelings, and (what is perhaps more influential than anything else) more means of rewarding the demagogues of various classes who flatter and mislead them.

Even when most unequally distributed, large fortunes are benefits to the many, and more beneficial to them than to the few. By seeking investments, making improvements, educating skill, competing with other capital, and reducing the prices of commodities, they do more good to their servants than to their owners. By reducing the prices of production and distribution, they make life cheaper and more comfortable. In the regions where large capitalists and great corporations are most numerous, there wages are highest and laborers most prosperous, intelligent and independent. The factory system raises the standard of life for the working man. It takes him from the isolation and ignorance of the petty village shop to the companionship and enlightenment of the mill in the city. It compels him to be punctual, and rewards his capacity. It educates him by making him familiar with complicated and ingenious machinery. It substitutes the more desirable variety of mental observation for the less desirable variety of muscular effort. It opens the career for his talent.

Industry, polity and education could not have made the great advances which they have made in modern times without carrying morality to higher phases. In our Era, for the first time, many millions of people find themselves securely enjoying equal political and civil rights in large and highly enlightened nations which by almost unrestricted

competition of their inhabitants in the race for learning, wealth and honor, are ideal ethical schools. Cleanliness, comfort, security, freedom, thrift, refined manners and literary taste are factors of morality; they drive out many vices that prevail under the dominion of ignorance, oppression and superstition; they lift humanity to a higher level. They have never been so widely diffused or so potent as at present; and never was the general condition of mankind been more satisfactory and hopeful.

The ethical doctrine now dominant among educated men is meliorism—the belief that our race is becoming better and happier; that the predominant tendency in the changes of human life is beneficent; that morality is a necessary accompaniment of our mental growth; that there are no proper tests of ethical obligation except reason and experience; finally, that the governing motive in the noblest actions has always been the enjoyment of life.

APPENDIX.

The purpose of this Appendix is to tell the reader where he may find the best books on the history of culture or any of its important branches.

Among those who have thrown light on this subject by perspicuous statement and original thought, Herbert Spencer stands first. He has explained the origin and growth of many political, social and ecclesiastical institutions and ideas.

Comte's division of the history of culture, into the metaphysical, theological and positive eras has, in my opinion, no value.

Buckle's Introduction to the History of Civilization is a highly interesting book and excellent to provoke thought.

The highest authority in anthropology is T. Waitz, who, in his *Anthropologie der Natur Voelker*, treats of the cultured conditions of all savage tribes and of the Aztecs and Quichuans. Part of his book has been translated into English.

The Manners and Customs of the Ancient Egyptians by J. G. Wilkinson, edited by S. Birch, is an admirable book, and so is the account of the manners and customs of modern China in The Middle Kingdom by S. W. Williams.

A History of the Mental Growth of Mankind in Ancient Times by J. S. Hittell gives an account of the evolution of culture until the overthrow of the Roman Empire.

The fullest account of ancient Greek culture is given by Grote.

For the date and composition of the Pentateuch, see De Wette, Kuenen and Wellhausen; for those of the gospels, the anonymous book entitled Supernatural Religion, and the article on the gospels in the Encyclopedia Britannica.

In relation to the Papacy, see Milman's "Latin Christianity," Lea's "History of the Inquisition," Draper's "Conflict of Science with Religion," White's "Warfare of Theology and Science," and Hittell's *Spirit of the Papacy*."

A good history of the British Constitution is that of Stubbs; of the American constitution that of Holst.

A notable pantheistic poem is Goethe's *Proëmium* which has been translated into English by J. Addington Symonds.

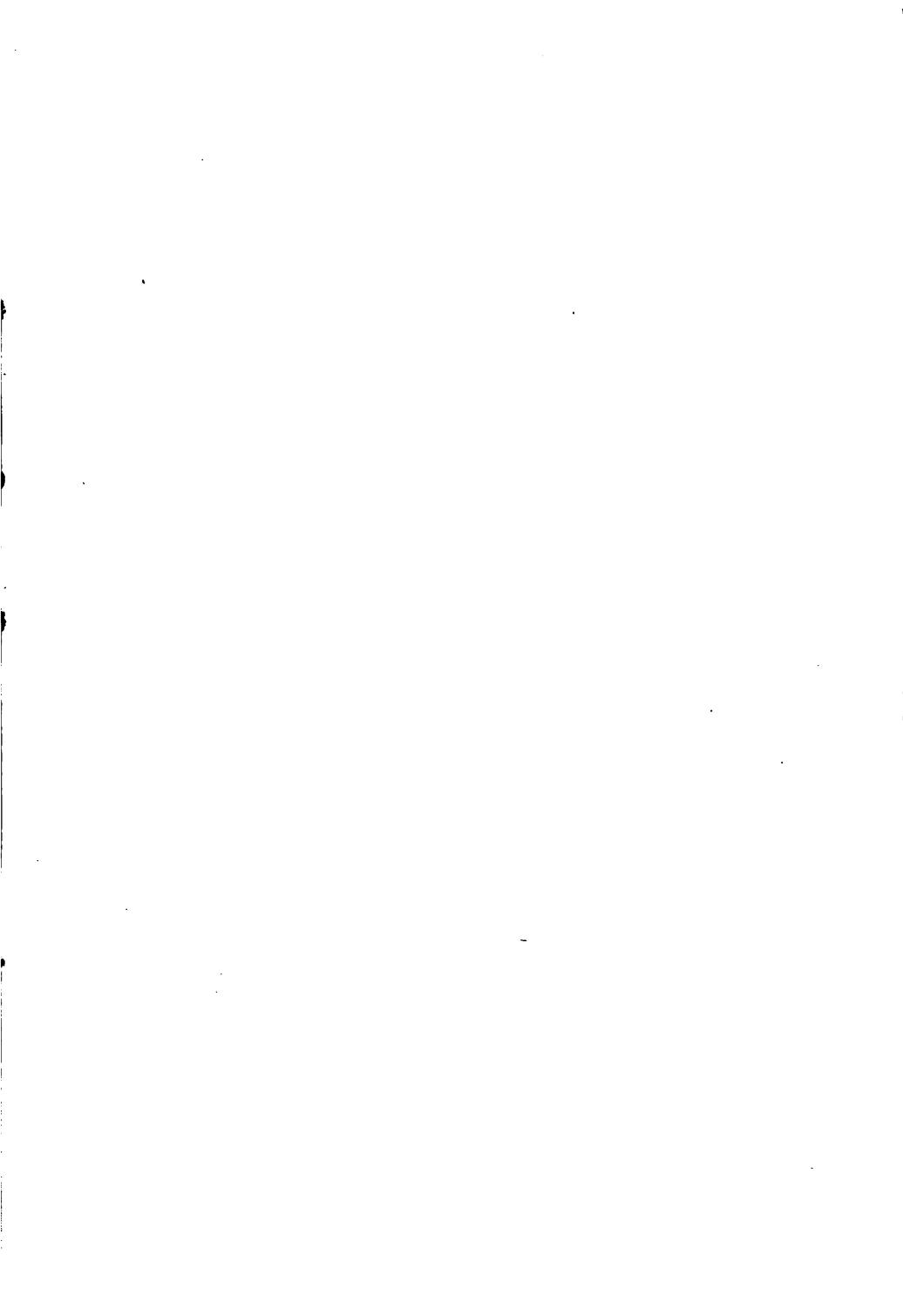
There is no good history of industry; none of inventions; none of agriculture; none of textile machinery brought down to 1875; none of metallurgy; none of polity; none of the military art brought down to 1875; and none of religion.

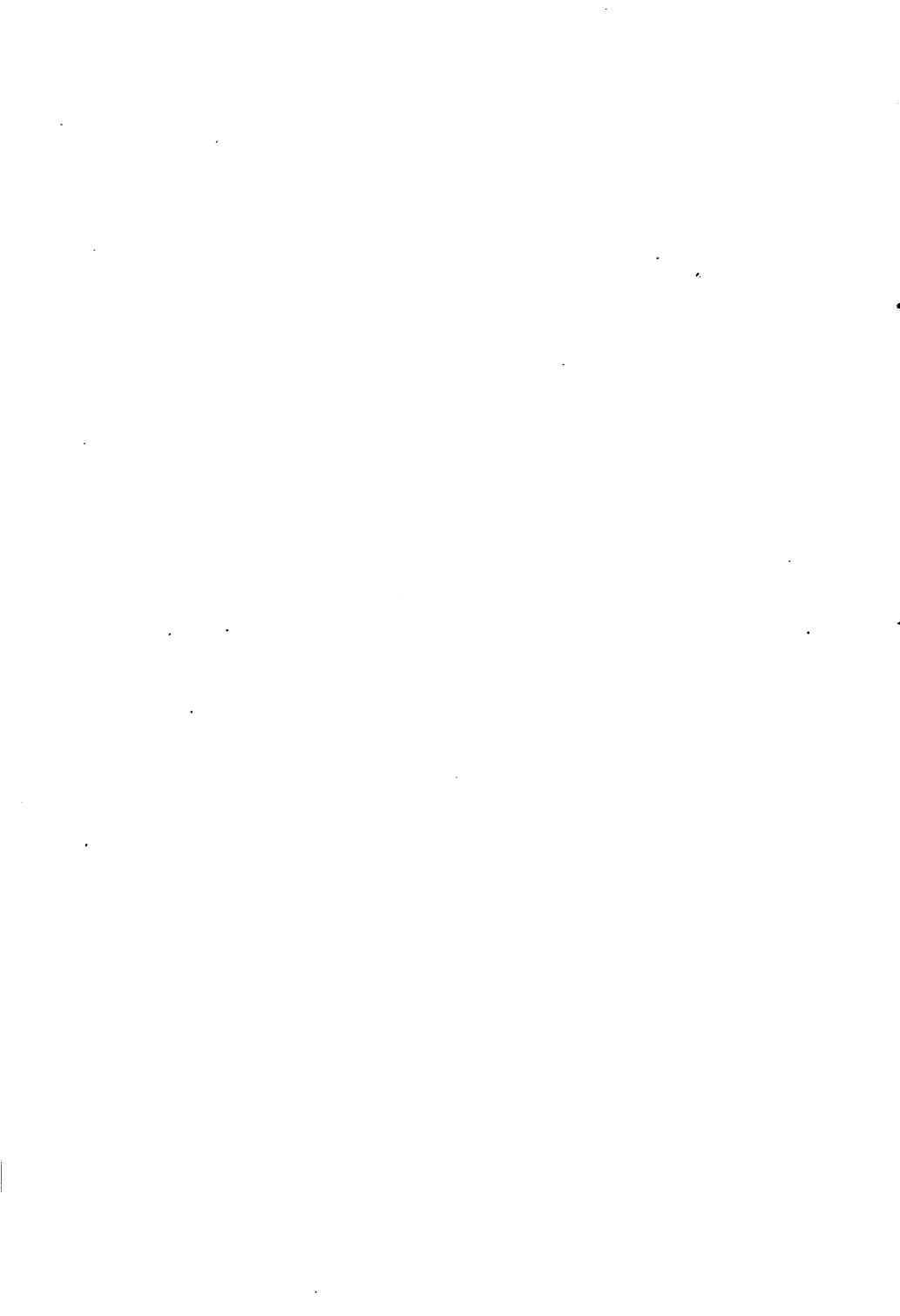
Lippert's History of Priestcraft in German is good.

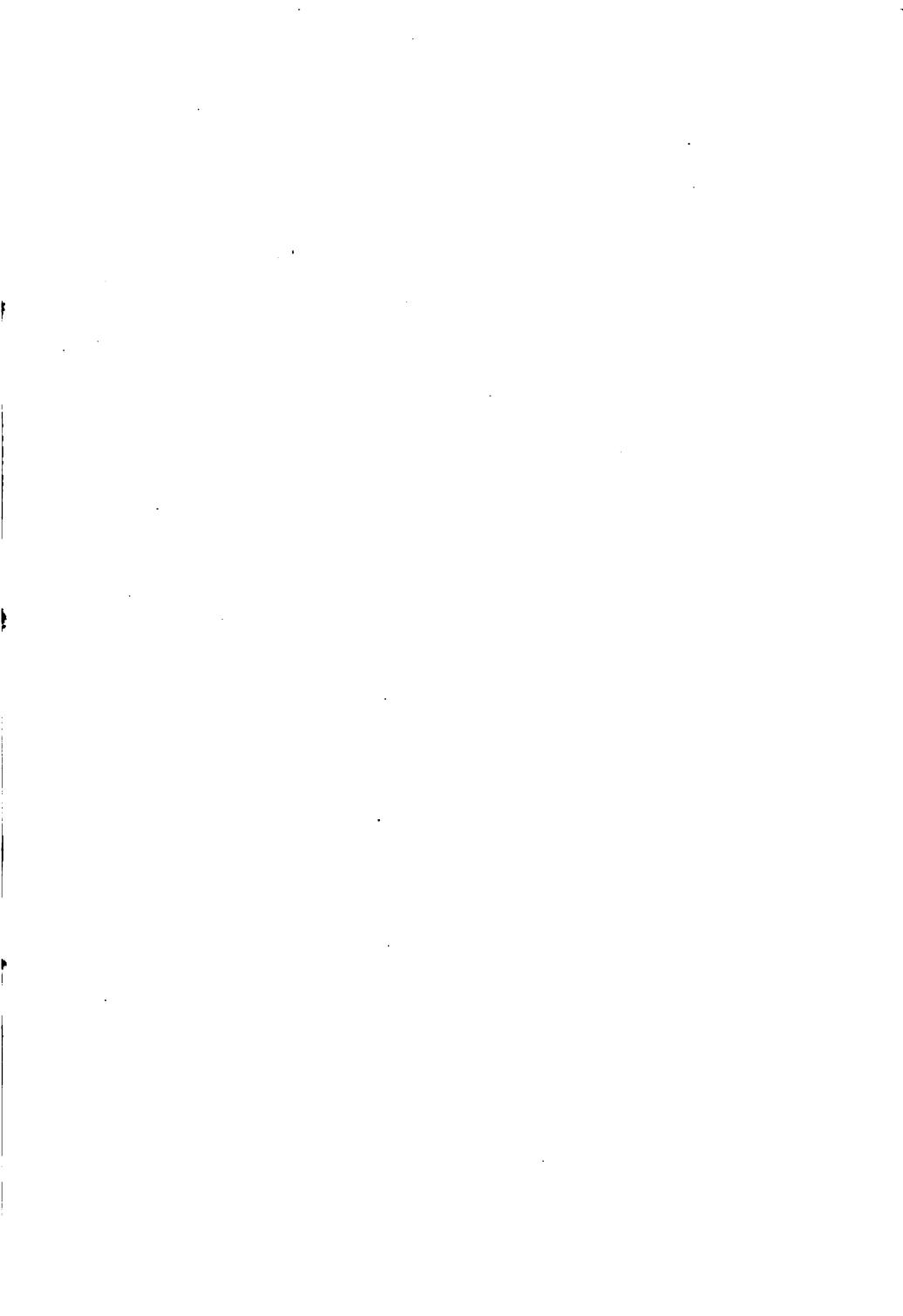
An impartial history of the Trade Union is needed; a very partial one has been published by Mr. and Mrs. Webb, who do not mention its fundamental principle nor the numerous great crimes which have been its most characteristic achievements, nor the serious pecuniary damage which it has done to the laboring classes as a whole.

Comprehensive histories of culture have been written in German by Kolb, Hellwald and Henne Am-Rhyn, and in French by Seignobos and Ducoudray, and the last is the only one of these whose work has been translated into English. The books on the culture of different nations and periods are too numerous for mention here.

THE END.









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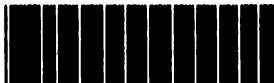
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